



TROCAR SITE HERNIA SEEN AFTER LAPAROSCOPIC SURGERY

Vedat Bayrak*

Ceyhan State Hospital, General Surgery, Ceyhan/Adana/ Turkey

ARTICLE INFO

Article History:

Received 8th March, 2018

Received in revised form 10th

April, 2018

Accepted 24th May, 2018

Published online 28th June, 2018

Key words:

trocar, hernia, laparoscopy, surgery

ABSTRACT

Background: As the use of laparoscopy in the surgery increases, complications caused by laparoscopy also increase. Some among the mare trocar site hernias which are some kind of incisional hernia that develops from the location of the trocars used during the procedure. In this article, we aimed to evaluate the information of 8 patients who were treated with trocar site hernia in the context of the literature.

Materials and Methods: Between October 2014 and February 2018 in our hospital, files of 8 patients who were operated on with trocar site hernia were reviewed retrospectively. Factors causing the trocar site hernias were considered as factors related to the technique and factors related to the patient.

Results: As a result of patient information and literature review, technical factors of trocar site hernia formations are trocars diameter, the closure of fascia, trocar site, extension of specimen removal site; Factors associated with the patient include obesity, diabetes, nutrition, and infection.

Conclusion: As a result, the trocar sites developed more frequently from the trocar sites 10 mm and larger, but also from the 5 mm trocar sites. It is recommended to close the fascia of the trocars 10 mm and larger for the prevention. There is no consensus for 5 mm trocar sites; they can be stopped for patients with obesity, diabetes, COPD and other risk factors.

Copyright © 2018 Vedat Bayrak. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

The examination of the abdominal cavity with a tubular device was first shown in 1901 by Kelling, in order to see the internal organs of a dog, by inserting a cystoscope into the abdominal cavity. In 1910, the Swedish surgeon Jacobaeus applied this method in humans and used the term laparoscopy for the first time. (1) The use of laparoscopy starting with cholecystectomy in the 1980s has begun to be used more and more frequently in parallel with the developing medical industry. Nowadays, almost every preabdominal surgery done with conventional methods became possible with laparoscopic method. The use of laparoscopy both in more surgical procedures and in more complicated cases has led to the occurrence of laparoscopic-specific complications, such as trocar sites hernias, and these complications are more common. The incidence of herniated trocar site is around 0.74% (2) This incidence varies slightly with respect to the surgical procedure. However, it has been reported that the patients who have asymptomatic have trocar location hernias frequently do not apply to the hospitals and therefore the incidence may be higher than these rates. (3)

MATERIAL METHOD

Between October 2014 and February 2018, files of 8 patients with trocar site hernia were reviewed retrospectively in our

hospital. Gender, age, trocar location, size of fascial defect, additional diseases, duration between laparoscopic procedure and hernia development and treatment modality were evaluated from patient records.

No statistical software program was used in the study.

Since the study was conducted on the basis of the information in the patient's files, the Ethics Committee Approval was not received, but the patient's consent was obtained from patients regarding the use of information related to age, sex and illnesses with the purpose of writing a medical article. The study was conducted in accordance with the Helsinki Declaration of the World Medical Association.

RESULTS

Six of the patients were female, two were male. The mean age was 56.1 (56.3 in women, 55.5 in men). All of the cases had previously undergone laparoscopic cholecystectomy, but a woman had undergone laparoscopic sleeve gastrectomy with cholecystectomy for obesity reasons. Four of the patients were herniated from the epigastric trocar entry site, 3 from the umbilical trocar entry site and 1 from the right lower trocar entry site (5). Two patients had a facial defect with a diameter of 1 cm, two patients had a facial defect with a diameter of 2 cm, two patients had a facial defect with a diameter of 3 cm,

*Corresponding author: Vedat Bayrak

Ceyhan State Hospital, General Surgery, Ceyhan/Adana/ Turkey

one patient had a facial defect with a diameter of 4 cm, and one patient had a facial defect with a diameter of 5 cm. Hypertension (HT) and diabetes mellitus (DM) was observed in one of the patients, unnoticed stones and associated localized infection in the DM and trocar site was observed in another patient, infection in the early trocar site in some, one of them was aHbsAg carrier, one of them had HT, hyperlipidemia and anemia, one had obesity and one had DM, HT and anemia. There was no additional disease observed in the last patient. The mean time between laparoscopic procedure and hernia surgery was 28 months (the shortest 2 months, the longest 83 months). The patient, who had stones and hernias that had escaped from notice, was treated with primary repair because of the infection, onlay mesh herniorraphy operation was performed on remaining 7 patients. The mean duration of operation was 61 (the shortest 30 min-the longest 110 min). (Table 1: Patient information).

Table 1 Patient information

Patient	Gender	Age	Trocar size (cm)	Comorbidity	Interval(month)	procedure	Op. date	Op. time(hr)
1	Male	50	umbilical	5 early wound infection		37 mesh herniorrhaphy	23.10.2014	110
2	Female	56	epigastric	3 HT+ DM		43 mesh herniorrhaphy	19.08.2015	65
3	Male	61	epigastric	1 DM+ unnoticed stone		26 primer repair	05.01.2016	50
4	Female	65	epigastric	3 HbsAg+		12 mesh herniorrhaphy	25.01.2017	50
5	Female	56	epigastric	2 HT+ Hyperlipidemia+ anemia		83 mesh herniorrhaphy	28.02.2017	65
6	Female	60	right lower	2		12 mesh herniorrhaphy	31.10.2017	60
7	Female	43	umbilical	1 obesity (sleeve gastrectomy)	12 and 2	mesh herniorrhaphy	28.12.2017	30
8	Female	58	umbilical	4 DM+ HT+Anemia		12 mesh herniorrhaphy	21.02.2018	60

DM: Diabetes mellitus HT: Hypertension

DISCUSSION

Many factors have been investigated and accused about formation of the trocar site hernia. These can generally be divided into technically linked factors and patient-related factors. Technical factors include trocar diameter, fascia closure, pneumoperitoneum formation, trochal location, extension of specimen removal site. Factors related to the patient include obesity, diabetes, nutrition, infection and additional diseases (3)

Perhaps the most studied thing about the trocar site hernias is the trocar diameter. Most of the trocar site hernias consist of trocar sites with a diameter of 10 mm or more. In the 54 cased trocar sites hernia presentation, there were trocars with a diameter of 10 mm or larger in 52 (96%) cases (4). In another case, in which 18 cases were investigated, all of the cases were caused by 10 mm trocars (5). Nevertheless, there are publications reporting that hernia has developed from small trocars of less than a diameter of 10mm (4,6). In addition, due to the anatomically weaker midline and umbilicus, trocar sites are often seen in these localizations. It is also reported that the most manipulation during the operation is from trocars in the umbilical and epigastric regions, and these trocar sites enlarge more and cause a risk for hernia (7). Also in cases in this presentation, middle and even more trochanter site hernias were examined (7 cases from 8 cases), and a rare 5 mm trochanteric hernia was detected in case 1. However, trocar hernia mostly seen in the umbilical region in the literature was detected more often in this serigraphy epigastric region in this series (4 epigastric, 3 umbilical). This may be due to the fact that surgeons often have to close the umbilical trochal fascia and tend not to close the epigastric trocar site.

It is now as if a consensus has been reached about the closure of the fascia of trocars of almost 10 mm and larger diameters (2,3,4). However, there are also reports that there is no difference between closing the fascia and not closing the fascia

when the abdomen entered by blunt trocars in non-obese patients with no additional diseases (8). There are different opinions as to whether or not 5 mm trocars should be closed. However, the general approach is to close 5 mm trocar sites in patients with risk factors for hernia (obesity, DM, malnutrition, asthma, bronchitis, etc.) (4,6,9). In this case series, more hernia at the 10 mm trocar site in the epigastric region is probably due to the surgeon's habit of closing the umbilical trocar site fascia and not closing the fascia in the trocar of the epigastric region. Another reason may be that the specimen is frequently removed from the epigastric trocar site and the fascia is enlarged while this removal procedure is being performed. Even though 5 mm trocar sites were closed in patients with generalized risk factors, no case was found to be a risk factor for the 5 mm trocar hernia seen in this case.

As in other incisional hernias, comorbidities have also been accused in the trocar site. The most commonly examined diseases are obesity, diabetes, nutrition, infection and respiratory diseases. There are studies indicating that obesity is an important predisposing factor (9,10,11). Only one of these patients had obesity, she had undergone sleeve gastrectomy 12 months ago and laparoscopic cholecystectomy 2 months ago. Diabetes is, of course, one of the other risk factors that disrupt wound healing (5). There were three of these patients with diabetes. Wound site infections are also an important factor causing the trocar site hernias that disrupt wound healing (5,12). In this series wound infection was present in a case of localized infection, which developed due to stones that escaped from notice when the preperitoneal area specimen was removed at the trocar site. It was thought that the mechanical effect of the stone and the stone-related infection prevented the facial healing and caused hernia formation. We were informed that patient had infection and discharge at the umbilical trocar site in the early postoperative period. No other anamnesis was received from the other 6 patients. Nutritional deficiency (malnutrition) also causes lack of minerals and vitamins for wound healing may play an important role in the formation of trocar site hernia (13). Malnutrition was not observed in the patients on this series. Diseases of the respiratory system, such as chronic obstructive pulmonary disease and asthma, also cause coughing and difficult breathing, resulting in increased intraabdominal pressures and thus trocar site herniation (5, 9, 13). There were no patients with respiratory disease in this series. Although anemia and trocar site hernia relationship are not evaluated very much, it can be thought that anemia which causes disruption of wound healing may also cause the trocar site hernia. Shallow anemia was present in two patients in this series. (Hb: 11 and 11.4 mg / dl).

The surgical procedure for the trocar site hernia is completed with primary repair and mesh. Primary repair or mesh repair should be performed according to the size of the facial defect and the presence or absence of existing risk factors (obesity, diabetes, etc.). However, optimal treatment has not yet been clarified (4). Some authors suggest a case of over 5 cm, and some authors recommend a 2 to 3 cm vascular mesh (4,5). However, since there is not much study on this subject, selection will be appropriate according to the decision of the patient oriented surgeon who plans the treatment according to the risk factors. Primer repair is generally takes less time and is less costly, while repair with mesh involves less risk of recurrence. We chose to repair trocar site hernias with the mesh as it was in incisional hernias. In only one case, primer

repair was done because of infection. No recurrence has been observed in any of the patients until now.

CONCLUSION

As a result, the trocar site hernias developed more frequently from the trocar sites with 10 mm diameter and larger, but also from the 5 mm trocar sites. It is recommended to close the fascia of the trocars with 10 mm diameter and larger for the prevention. There is no consensus for 5 mm trocar sites but they can be stopped in patients with obesity, diabetes, COPD and other risk factors. However, we also want to remind you that the 5 mm trocar site in our series is not a risk factor for the herniated patient. For this reason, our recommendation is not to routinely close 5 mm trocar sites, but to keep in mind that these trocar sites may develop hernia in postoperative period, especially in patients with risk factors.

Patients with trocar site hernia can be treated with primary repair or mesh repair. Mesh repair will be a more appropriate treatment method as the size of the facial defect increases. However, a consensus has not been reached in this regard and the decision is left to the surgeon to organize the treatment.

There is no relevant conflict of interest with the article.

No financial support was received for the article.

References

1. Göney E. Endoskopik (Laparoskopik) Cerrahinin Tarihiçesi. *Turkiye Klinikleri J MedSci* 1994;14(2):79-86
2. Owens M, Barry M, Janjua A.Z, Winter D.C. A systematic review of laparoscopic port site hernias in gastrointestinal surgery *Surgeon* (2011) 9(4):218–224
3. Tonouchi H, Ohmori Y, Kobayashi M, Kusunoki M. Trocar site hernia. *ArchSurg* 2004;139:1248-1256
4. Lambertz A, Stüben B.O, Bock B, Eickhoff R, Kroh A, Klink C.D, et al. Port-site incisional hernia – A caseseries of 54 patients. *Annals of Medicine and Surgery* 14 (2017) 8-11.
5. Kumar S, Maurya O.K. Predisposing Factors, Prevention and Treatment of Trocar site Hernia. *JMSCR* Vol 06, Issue 03, Page 1093-1097, March.2018
6. Girgin M, Kanat BH, Çetinkaya Z, Ayten R, Bozdağ A. Fivemillimeters Lateral Trocar Incarcerated Hernia Following Laparoscopic Cholecystectomy: A Case Report. *Erciyas Med J* 2013; 35(4): 245-7.
7. Mayol J, Garcia-Aguilar J, Ortiz-Oshiro E, De-Diego Carmona JA, Fernandez-Represa JA: Risk of the minimal access approach for laparoscopic surgery: multivariate analysis of morbidity related to umbilicaltrocarinsertion. *World J Surg* 21:529–533, 1997.
8. Singal R, Zaman M, Mittal A, Singal S, Sandhu K, Mittal A. No Need of Fascia Closure to Reduce Trocar Site Hernia Rate in Laparoscopic Surgery: A Prospective Study of 200 Non-Obese Patients. *Gastroenterology Res.* 2016 Oct;9(4-5):70-73.
9. Dincel O, Basak F, Goksu M. Causes of asymptomatictrocar site hernia: How can it be prevented? *North ClinIstanbul* 2015;2(3):210-214.
10. Eid G.M, Collins J. Application of a trocarwound closure system designed for laparoscopic procedures in morbidlyobese patients, *Obes. Surg.* 15 (2005) 871e873.
11. Chatzimavroudis G, Papaziogas B, Galanis I, Koutelidakis I, Atmatzidis S, Evangelatos P, et al. Trocar site hernia following laparoscopiccholecystectomy: a 10-year single center experience. *Hernia* (2017) 21: 925.
12. Callery MP, Strasberg SM, Soper NJ. Complications of laparoscopic general surgery. *Gastrointest Endosc Clin N Am.* 1996 Apr;6(2):423-44
13. Coda A, Bossotti M, Ferri F, Mattio R, Ramellini G, Poma A, et al. Incisionalhernia and fascial defect following laparoscopic surgery. *Surg Laparosc Endosc Percutan Tech* 2000;1034- 38

How to cite this article:

Vedat Bayrak (2018) 'Trocar Site Hernia Seen After Laparoscopic Surgery', *International Journal of Current Medical And Pharmaceutical Research*, 04(6), pp. 3425-3427.
