Second Reported Case Of Non-Trocar Injury Of Inferior Epigastric Artery During Laparoscopic Tapp Repair Of Inguinal Hernia

D Raje, M Saunders, H Mukhtar, A Oshowo

Citation

D Raje, M Saunders, H Mukhtar, A Oshowo. *Second Reported Case Of Non-Trocar Injury Of Inferior Epigastric Artery During Laparoscopic Tapp Repair Of Inguinal Hernia*. The Internet Journal of Surgery. 2006 Volume 9 Number 2.

Abstract

Background: Inferior Epigastric injury is a rare yet well-known phenomenon during laparoscopic hernia repair and almost all reported cases have been due to trocar injury[1,2,3,4]. There has been only one reported case of injury due to sharp dissection in literature [5]. This however might be under reported.

Aim: We would like to report our unusual experience of inferior epigastric artery injury during laparoscopic TAPP (Trans-abdominal pre-peritoneal) repair of bilateral inguinal hernia.

Case: A 75 year old underwent TAPP repair for bilateral inguinal hernia. Post-operatively he developed hypotension and a fall in haemoglobin to 4gm/dl and was taken for a laparotomy. At laparotomy a transacted right inferior epigastric artery was found which had to be ligated. He had an uneventful recovery.

Conclusion: Laparoscopic hernia repair is a relatively safe procedure, but like any other it has its own set of complications. Most vascular injuries are during trocar insertion although the demand for advanced technical skills and the long learning curve may result in lesser-known injuries such as during dissection. Early recognition of vascular injury is paramount to expeditious treatment. Sound knowledge of the anatomy of abdominal wall and appropriate training will reduce the occurrence of such complications.

INTRODUCTION

Inferior Epigastric Artery injury is a well-known phenomenon during laparoscopic hernia repair and almost all reported cases have been due to trocar injury[$_{1,2,3,4}$]. There has been only ‘one reported case' of injury due to sharp dissection in literature [$_{5}$]. This however might be under reported.

We are reporting our experience of inferior epigastric artery injury at dissection during laparoscopic TAPP (Trans-abdominal pre-peritoneal) repair of bilateral inguinal hernia. This is only the ‘second case' reported in literature with such a complication.

Trocar injury is a potentially serious but preventable complication that occurs in 0.2% to 2% of laparoscopic surgery [$_{6,7,8,9,10}$]. Both superficial and deep epigastric vessels are at risk [$_{10}$]. The superficial abdominal wall vessels may be located by transillumination. However, the deep epigastric vessels cannot be effectively located by that method [$_{11,12}$].

Although trocar injury is the most common form of injury to the inferior epigastric artery, this can also occur occasionally during sharp or blunt dissections to separate the sac. This is due to the close proximity of the sac to the vessels. The injury may initially go unrecognized due to the temporary tamponade by spasm of the severed ends as well as pneumoperitoneum and present as retroperitoneal haematoma or pseudoaneurysm later [$_{13}$].

Identification of injury at the earliest is crucial to prevent post operative morbidity and mortality.

CASE

A 75-year-old male underwent an elective TAPP repair for a bilateral inguinal hernia. The right side had a recurrent hernia whereas the left was a primary inguinal hernia.

Day1 post-op: Patient had hypotensive episodes, which were corrected with fluid replacement. Patient remained pain free and there was no evidence of bleeding from port sites. A fall in urine output was attributed to an outlet obstruction due to failure of repeated catheterisations. A fall in haemoglobin by 4 units raised the suspicion of a possible vascular injury and a laparotomy was performed. A transected inferior epigastric artery on the right was found with a retroperitoneal haemotoma. The severed ends were ligated to achieve haemostasis. Patient needed ionotropic support post-operatively on the intensive care unit but had a complete recovery.

DISCUSSION

Laparoscopic hernia repair is a relatively safe procedure, but like any other it has its own set of complications. Most vascular injuries are during trocar insertion [1,2,3,4] although the demand for advanced technical skills and the long learning curve may result in lesser-known injuries such as during dissection [5].

As we all know it is crucial to know the anatomy of the abdominal vessels accurately before attempting laparoscopic surgery.

Anatomical variations may occur on account of age or BMI. One large study has suggested that regardless of the abdominal level, epigastric vessels (superior or inferior) are usually located in the area between 4 and 8 cm from the midline. Staying away from this area, either medially or laterally, will determine the safety zone of entry the abdominal wall without risk of injury to the epigastric vessels. To avoid accidental injury to the epigastric vessels, the anatomic landmarks should be considered whenever the anterior abdominal wall is to be violated [2].

In some cases, the normal anatomy can be masked by complex, recurrent or incarcerated hernia. It is recommended that the surgeon should begin dissecting from an area of normal anatomy and slowly dissect away the tissue so the landmarks can be identified [14].

Abdominal wall bleeding can be controlled with a variety of techniques [9, 12, 15]. This includes application of direct pressure with the operating port, full-thickness abdominal wall suture ligation or tamponade with Foley catheter balloon inserted through the trocar site. If all these manoeuvres fail to control the bleeding, exploration of the wound is mandatory. This may lead to unnecessary prolongation of the laparoscopic procedure or conversion to laparotomy with loss of all the advantages of minimally invasive surgery. Bleeding from the inferior epigastric vessels may also result from dissection of the hernia sac, but can usually be easily controlled by utilizing a two-handed technique, one instrument to compress the vessel and the other to ligate, clip or coagulate it. However failure to identify such an injury at the time of operation may lead to serious consequences as in our case.

CONCLUSION

We recommend from our own experience that a sound knowledge of the anatomy and its variations in different cases is vital for trainees before embarking on laparoscopic hernia repairs. This may be achieved by reviewing tapes or videos of dissections performed by other experienced laparoscopic surgeons. Before undertaking one's first laparoscopic hernia repair, it is important that the surgeon assists other skilled surgeons as part of the learning process.

Besides learning the right technique, a high index of suspicion and low threshold for investigation should be practiced by trainee surgeons who are learning to perform laparoscopic hernia repairs.

CORRESPONDENCE TO

Mr. Durgesh S Raje C/O Mr. Hasan Mukhtar Whittington Hospital 2 nd Floor, Jenner Building The Whittington Hospital Highgate Hill London N19 5NF Email: durgeshraje@hotmail.com Tel: 02072723070 Bleep: 3063 Fax: 02072883199

References

1. Epstein J, Arora A, Ellis H Surface anatomy of the inferior epigastric artery in relation to laparoscopic injury. Clin Anat. 2004 Jul; 17(5): 400-8.
2. Saber AA, Meslemani AM, Davis R, Pimentel R. Safety zones for anterior abdominal wall entry during laparoscopy: a CT scan mapping of epigastric vessels. Ann Surg.2004 Feb; 239(2):182-5.
3. Hurd WW, Pearl ML, DeLancey JO, Quint EH, Garnett B, Bude RO. Laparoscopic injury of abdominal wall blood vessels: a report of three cases. Obstet Gynecol. 1993 Oct; 82 (4 Pt 2 Suppl): 673-6.
4. Pring DW. Inferior epigastric haemorrhage, an avoidable complication of laparoscopic clip sterilization. Br J Obstet Gynaecol.1983 May; 90(5):480-2.
5. Nordestgaard AG, Bodily KC, Osborne RW Jr, Buttorff JD. Major vascular injuries during laparoscopic procedures. Am J Surg. 1995 May; 169(5):543-5.
6. Zaki H, Penketh R, Newton J. Gynaecological laparoscopy audit: Birmingham experience. Gynecol Endocrinol. 1995; 4:251-257.
7. Aharoni A, Condea A, Leibovitz Z, et al. A comparative study of Foley catheter and suturing to control trocar-

induced abdominal wall haemorrhage. Gynecol Endocrinol. 1997; 6:31-32.
8. Vasquez JM. Vascular complications of laparoscopic surgery. J Am Assoc Gynecol Laparosc. 1994; 1:163-167.
9. Spitzer M, Golden P, Rehwaldt L, et al. Repair of laparoscopic injury to abdominal wall arteries complicated by cutaneous necrosis. J Am Assoc Gynecol Laparosc. 1996; 3:449-452.
10. Hurd WW, Pearl ML, DeLancey JO, et al. Laparoscopic injury of abdominal wall blood vessels: a report of three cases. Obstet Gynecol. 1993; 82(4 Pt 2 suppl):673-676.
11. Quint EH, Wang FL, Hurd WW. Laparoscopic transillumination for the location of anterior abdominal wall blood vessels. J Laparoendosc Surg. 1996; 6:167-169.
12. Tomacruz RS, Bristow RE, Montz FJ. Management of pelvic hemorrhage. Surg Clin North Am. 2001; 81:925-948.
13. Verbist J. Pseudoaneurysm of the inferior epigastric artery. Acta Chir Belg. 1997;97:196-198.
14. Edward L. Felix, Chapter 15. Laparoscopic Hernia Repair, http://laparoscopy.blogs.com/prevention_management/chapter_15_hernia_repair/index.html
15. Lin P. Complications of laparoscopy: strategies for prevention and cure. Obstet Gynecol Clin North Am. 1999; 26:23-38.

Author Information

Durgesh Raje, MS, FRCS
Department of Surgery, The Whittington Hospital

Michael Saunders, MSc, FRCS
Department of Surgery, The Whittington Hospital

Hasan Mukhtar, FRCS
Department of Surgery, The Whittington Hospital

Ayo Oshowo, MD, FRCS
Department of Surgery, The Whittington Hospital