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

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Citation

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[12,13]. There has been only ‘one reported case’ of injury due to sharp dissection in literature [4]. 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 [14,15,16]. Both superficial and deep epigastric vessels are at risk [16]. 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.
Day 1 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 haematoma. The severed ends were ligated to achieve haemostasis. Patient needed inotropic 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] although the demand for advanced technical skills and the long learning curve may result in lesser-known injuries such as during dissection [1].

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 [4].

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 [5].

Abdominal wall bleeding can be controlled with a variety of techniques [5, 12, 13]. 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.

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