Potential complications of the blind technique of port insertion during laparoscopy

Introduction

Minimally invasive surgery has revolutionized the management of various general surgical, urological and gynaecological conditions in terms of reducing patient morbidity (Cunningham, 1998). Vascular injury is a rare but serious complication of laparoscopic procedures and defeats the very purpose for which this approach is chosen in the first place.

This article reports three cases of serious vascular injury in healthy young patients that resulted from using inadequate techniques for port insertion. Port insertion is a vital component of laparoscopic surgery and one fraught with potentially life-threatening complications. This article emphasizes the importance of a safe port insertion technique.

Case Report 1

A 32-year-old previously fit and healthy woman underwent laparoscopy, dye test, hysteroscopy and endometrial biopsy as part of the investigation of infertility, under the care of a consultant gynaecologist in a remote district general hospital. A radial umbilical incision was made, and the abdomen was raised by hand. An initial attempt was make to insert a trifin nailed trocar gently with a screwing movement, but the failure of this manoeuvre was attributed to relaxed thick fascia or a blunt trocar. A Veress needle was therefore introduced to its full length and was then withdrawn to half length; pneumoperitoneum was established. A good view of the pelvic organs was obtained and no abnormality was observed. The patient became haemodynamically unstable although no obvious source of bleeding was identified.

A laparotomy was performed through a right subumbilical paramedian incision and a large haematoma was noted anteriorly on the left side overlying the inferior vena cava and aorta, extending up to the left renal pedicle and down to the pelvic brim. The lateral extensions of the haematoma were contained at the peritoneal reflections. It was unclear which vessel was injured and as intensive therapy unit care was not available on site and the haematoma was contained, the incision was closed and the patient was transferred to the authors' tertiary care centre. Blood loss at this point was a 50 ml clot. On arrival the patient was unstable, acidotic and in coagulopathy with a systolic blood pressure of 50 mmHg. A second laparotomy was performed by extending the previous incision proximally into the epigastrium. A 1 cm tear at the origin of the right internal iliac artery was seen and repaired along with a tear of a right lumbar artery, which was ligated.

The patient remained in the intensive therapy unit for 48 hours and received a total of 36 units of packed red cells transfusion plus factor 7, fresh frozen plasma and platelets. Further postoperative recovery was uncomplicated. The patient developed secondary depression after the incident and also experienced intermittent abdominal pain.

Case Report 2

A 29-year-old woman in previous good health was listed for laparoscopy with or without right salphingo-oophorectomy and cystoscopy for investigation of mixed urinary incontinence and pelvic pain. Being on a generic list, the procedure was performed by another consultant gynaecologist and not her own consultant.

An umbilical incision was made and a trocar was inserted. On insertion of the camera, blood was noted in the pelvic cavity and it was not possible to maintain a pneumoperitoneum. A laparotomy was performed and the general and vascular surgeons were summoned. The injuries comprised tears of the right and left common iliac veins at the bifurcation plus avulsion of the right common iliac artery; each was repaired. A bleeding vessel in the mesentery was also ligated. The laparotomy incision extended from the xiphisternum to the pubic symphysis. The patient remained in the intensive therapy unit for 24 hours and was transfused 13 units of packed red cells. Postoperative recovery was uneventful. The patient now refuses to have any further gynaecological treatment at the centre where this occurred.

Discussion

Each of these operations was performed by a surgeon of consultant rank, yet what stands out is the poor technique which is documented in detail in the first case. The multiple nature of the injuries in each case reflects poorly on the technical proficiency of the operating surgeon. Since there is no evidence in the literature to recommend the open approach for establishing pneumoperitoneum over the use of the Veress needle or vice versa, routine practice is variable and based on personal preference.

Vascular injury secondary to initial port insertion is potentially lethal and may be initially unrecognized when the iliac vessels are involved (Seidman et al, 1996), these being the vessels most at risk (Dixon and Carrillo, 1999). Although rare, vascular injury has a reported incidence of 3 to 9 per 10 000 laparoscopies and is commonly reported in pelvic procedures (Franks et al, 1987). Body habitus may be an underlying factor with thin patients being at higher risk because of the proximity of the retroperitoneal vasculature to the anterior abdominal wall.

With the introduction of open techniques of initial port insertion such as

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Case Report 3

A 37-year-old previously fit woman was listed for a laparoscopic-assisted vaginal hysterectomy with a right salphingo-oophorectomy, the indication being cyclical pelvic pain following microwave endometrial ablation.

Pneumoperitoneum was initially established with a Veress needle followed by insertion of a 12 mm disposable trocar with a guarded blade. The camera was inserted and good views were originally obtained, but just as the second port was about to be inserted in the right iliac fossa, there was a drop in the end-tidal carbon dioxide followed by a loss in cardiac output which required cardiopulmonary resuscitation. The pneumoperitoneum was released, laparotomy performed and the left common iliac artery was found to be damaged along with injury to the small bowel. The vascular injury was repaired, which involved rotation of the internal iliac artery to bridge the defect together with sympathectomy.

The patient required massive blood transfusion and remained in intensive therapy unit for 48 hours. Postoperative recovery was uneventful and the patient was discharged home on day 9. The patient suffered extreme emotional trauma as a result of the incident and has decided never to undergo a laparoscopic procedure again. She suffered from swelling and warmth of her left leg and continued to have chronic abdominal pain.

Hasson's approach (Hasson, 1971), the incidence of this complication has declined steadily and efforts to improvise on this technique have been consistent. The safety of open port insertion techniques has been well tested in various series (Zaraca et al, 1999; Hasson et al, 2000). Nevertheless, clear evidence is still lacking to support one approach over another and adopting correct techniques for both approaches is important.

Access-related complications are most frequently associated with insertion of the initial umbilical port and a blind approach has been determined to be the only contributing factor (Mayol et al, 1997; Zaraca et al, 1999). Patients undergoing a closed technique are six times more likely to have complications (Mayol et al, 1997). Thus peritoneal penetration with a Veress needle (without adequate precautions like adequately tenting up the abdominal wall and inserting the needle to half length only) is an unnecessary risk as is blind insertion of the initial trocar.

Conclusions

Establishment of pneumoperitoneum is a key step in laparoscopic surgery, but it is associated with serious complications. Open laparoscopic techniques have proven efficacy in reducing the incidence of life-threatening vascular injury and should therefore be routinely used in view of their safety. A cautious attitude with meticulous attention to detail and standards can save a lot of misery for both the surgeon and the patient. **BJHM**

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