Open port placement through the umbilical cicatrix

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Abstract Peritoneal access and creation of pneumoperitoneum are the key initial steps of laparoscopic surgery. This is commonly achieved by either introducing Veress needle or by gradual dissection of all the layers of the abdominal wall and then introducing a port under direct vision. The two techniques are extremely safe, but large outcome studies have found slightly increased complications with the Veress needle. Randomized trials do not support such finding and both techniques continue to have their enthusiasts. We hereby describe an open method of initial port placement, wherein the port is introduced through the umbilical cicatrix under direct vision.

Keywords Laparoscopy · open port · umbilical cicatrix

Introduction

Since the first laparoscopic cholecystectomy in 1987, minimal access surgery continues to make rapid progress. The creation of a pneumoperitoneum is the first important step in laparoscopic surgery. The most popular method of peritoneal entry is by introducing a Veress needle through an infraumbilical stab and then insufflating the peritoneal cavity [1]. Although this is a safe technique concerns have been raised about its ‘blind’ nature, thereby necessitating techniques for introducing port under direct vision. One such procedure described by Hasson, begins with a small infraumbilical incision followed by dissection of all the layers of the abdominal wall [2]. We now describe another novel technique of open port placement.

Technique

The surgeon stands on the right side of the patient. The umbilical cicatrix is grasped at its pit by a towel clip and upward traction applied. This helps to evert the umbilicus (Fig. 1). The towel clip is now held by the left hand and sustained vertical traction lifts up the abdominal wall. At this stage a taut structure is felt underneath the umbilical cicatrix and an infraumbilical transverse skin incision is made. Using an artery forceps, the subcutaneous tissue is dissected. This reveals a short glistening white ligament like structure running from the rectus sheath to the umbilical cicatrix (Fig. 2). It is incised longitudinally with a number 11 blade and the peritoneal cavity entered. The entry wound is enlarged by introducing an artery forceps and opening its jaw. The 10 mm cannula with a blunt trocar is now inserted into the peritoneal cavity. With practice the cannula on its own could also be inserted.

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Result

Between March 2005 and September 2007, we have used this technique in 811 consecutive procedures and haven't had any visceral or vascular complication. None of these patients had prior laparotomy. In the small number of patients who have had laparotomy through a midline incision, and who have been excluded from this study, we have introduced the initial 10 mm port under vision high up in the epigastrium just to the right of the midline. On few occasions, the trocar/cannula has got 'lost' in the falciform ligament. This was specially so in the obese patients and re-directing the trocar/cannula is often successful. In 3 patients, we failed to enter the peritoneal cavity and had to resort to Veress needle.

Fig. 1 Everted umbilical cicatrix

Fig. 2 Exposed umbilical pillar

Discussion

The appeal of entering the peritoneal cavity through a stab at the depth of the umbilical cicatrix lies in its simplicity and relative safety, and can be easily mastered. The everted umbilical cicatrix exposes the ligament like structure running from the linea alba to the dermis of the umbilical cicatrix. This structure finds scant mention in standard textbooks of anatomy, but has been variously described as umbilical pillar/tube [3] and umbilical stalk [4]. This fibrous tissue is the embryological remnant of umbilical veins, arteries and urachus. Sustained upward traction on the umbilical cicatrix elevates the abdominal wall away from the vital organs and creates a space into which instruments could be safely introduced. In addition, the junction of the umbilical pillar/stalk with the linea alba is the thinnest part of the abdomen and at this point the peritoneum is fused to the linea alba as a single layer. A simple stab over this fibrous structure provides easy access into the peritoneal cavity. Similar technique has been described before and begins with an infraumbilical skin incision and grasping the umbilical stalk at the depth of the wound with an Allis forceps [3, 4]. This could be difficult in obese patients and requires retraction of the skin edges with a Langenbeck's retractor to reach down to the umbilical stalk. Our technique, wherein the umbilical cicatrix is everted at the very outset, lifts the umbilical stalk up to the wound thereby facilitating easy dissection of the stalk.

Port placement and creation of pneumoperitoneum is the key initial step in laparoscopic surgery. This is most commonly performed by introducing the Veress needle [1]. It is a safe technique but is essentially a 'blind' procedure. Other such blind techniques, which are rarely used, and finds mention for the sake of completion, are direct insertion of trocar/cannula through the parieties after lifting off the abdominal wall [5], insertion of a cannula in the 9th intercostal space on the left side [6] and Veress needle insertion through the uterine fundus [7]. To obviate the inherent drawback of such blind techniques, Hasson is credited with the first description of port introduction under direct vision [2]. This technique begins with a small infraumbilical incision followed by gradual incision of all the layers of the abdominal wall.

Comparison between closed and open techniques is inevitable, desirable and essentially revolves around ease of execution and attendant complications. The morbidity associated with creation of pneumoperitoneum by any of the technique is estimated to be <1% but the true incidence of visceral and vascular injury for the individual techniques is unknown [8]. Large outcome studies have showed that vascular injuries are more common with the Veress needle [9]. Extensive meta-analysis has shown that the open technique, on average, is associated with lower incidence of minor complications and is cheaper and faster than the Veress needle technique [8]. As opposed to the Veress needle, insertion of the trocar and subsequent insufflation is associated with less insufflation related complications

such as gas embolism [10]. However, randomised clinical trials comparing the two techniques did not show such unequivocal results. This is because, incidence of serious complications is very low and randomised trials, with inadequate sample size, cannot possibly detect any significant difference between the two procedures [8]. Hence, paucity of level I evidence precludes advocating one technique over the other [8, 10]. The new generation visual entry cannula system may represent an advantage over traditional trocars, as it allows a clear optical entry, but this does not necessarily avoid visceral and vascular injury [10].

The use of a particular technique ultimately depends on the clinician and patient subgroup i.e. presence of abdominal scar, obesity, etc. We believe that surgeons, who routinely perform open port placement, and those who intuitively feel that open port placement is a safer technique, should obtain peritoneal access through the umbilical cicatrix. The simplicity, rapidity and inherent safety of our technique, and its variants [3, 4] merit wider application. Perhaps, it is time to consign classical Hasson's technique to the end of its natural life cycle.

Conflict of interest The authors do not have any disclosable interest

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