

Laparoscopic access and port placement

Laparoscopic access and port placement

There are two fundamental ways to access the abdomen laparoscopically: - 1 the open technique (Hasson's or modified Hasson's) 2 the closed technique (Veress needle and/or visual entry trocar). The advantages and complication rates of each of these techniques are not significantly different; therefore, the technique that the surgeon is most accustomed to should be used. Figure 7.9 (a) (b) (d) (c) (e)

(a) (b) (d) Midline laparotomy incision. Skin incision; peritoneum is picked up between haemostats and incised; (c) (e) subcutaneous fat is incised; linea alba is opened to expose peritoneum; peritoneal cavity opened (courtesy of Dr Vinay Timothy Kuruvilla).

Figure 7.10 (a) (b) (c) (d) (e)

(c) (e) (d) Laparoscopic access to the abdomen using the mod

ified Hasson's technique. Umbilicus everted, revealing the stalk of the umbilicus. Periumbilical skin incision. The junction of the umbilicus and linea alba is identified and opened longitudinally. A curved haemostat used to break the peritoneum, which is then stretched open. A blunt-tipped primary trocar is inserted.

with both techniques to provide access as directed by circumstances such as pregnancy, scars from previous operations or as dictated by disease pathology. Blind trocar insertion with or without Veress needle insufflation is avoided. Open Hasson's technique for laparoscopic primary trocar insertion In most cases, the umbilicus is the preferred site for a 10–12-mm initial port placement (Figure 7.10a–e). 1 The umbilical cicatrix is everted with a toothed tissue-grasping forceps. It is important to grasp the cicatrix directly as this is closest to the adherent peritoneum. Counter-traction is maintained throughout the subsequent steps until the primary trocar is inserted. 2 The umbilical stalk is palpated inferior to the everted cicatrix while maintaining cephalad traction. 3 A curved 10–12-mm transverse incision is made inferior to the cicatrix. 4 The umbilical stalk is exposed with sharp and blunt dissection to reveal the decussation (crossing) of fibres just above its junction with the linea alba. 5 A 5-mm vertical incision is made through the decussation with an

11-blade scalpel, taking care only to incise the fascia at this point and not to enter the peritoneum. 6 A blunt haemostat angled away from the bowel and major vessels is then pushed through the pre-peritoneal fat and peritoneum; the surgeon will feel a 'pop' as the instrument enters the peritoneal cavity. 7 A blunt-tipped 10- or 12-mm trocar is pushed through the same point of insertion of the haemostat and in the same direction. 8 The laparoscopic camera is used to confirm successful placement in the peritoneal cavity before insufflation with CO gas. 9 CO gas insufflation is commenced at low flow (1–4 litres per minute) and increased to a maximum pressure of 15 mmHg and with a maximum flow rate of 20 L/min. 10 For the patient with scars from previous abdominal surgery, the safest technique is an open approach at Palmer's point, 3 cm below the left subcostal margin in the mid-clavicular line. Adequate lighting and good assistance with retraction are essential. Veress needle and optical entry A Veress needle is a spring-loaded needle that consists of an outer sharp bevel that cuts through tissue. Once the needle enters the peritoneal cavity, owing to the loss of resistance the spring-loaded blunt inner stylet deploys and prevents inadvertent injury to the bowel or blood vessels. The Veress needle can be inserted in the umbilical region or in other regions of the abdomen, such as Palmer's point. The steps involved in Veress needle insertion are as follows (Figure 7.11). Raoul Palmer, 1904–1945, gynaecologist, France. - - - - Figure 7.11 1 A 10-mm incision in Palmer's point (3 cm below the left costal margin, in the mid-clavicular plane) is the location preferred by many surgeons for Veress needle insertion. 2 The needle is advanced until it reaches the muscle. The abdominal wall is then lifted and the needle advanced through the oblique muscles. 3 Classically, a 'pop' is heard and a 'give' felt on successful insertion into the peritoneal cavity. 4 The intraperitoneal placement is confirmed using a combination of the following techniques. The hanging drop method, wherein a drop of water is placed in the hub of the needle; on elevating the abdominal wall the resultant loss of intra-abdominal pressure would result in the drop emptying into the abdominal cavity. Free flow of saline into the peritoneal cavity and no return of bowel content or blood on aspiration. Abdominal pressure reading of less than 10 mmHg. 5 Once the position is confirmed CO insufflation at a slow pace is commenced until the target pressure is reached. The needle is now removed.

(c) (b) Veress needle to establish pneumoperitoneum (courtesy of Dr Vinay Timothy Kuruvilla).

flation: The primary port is placed by following the Veress needle track. A visual entry port is recommended as it allows for a more controlled entry under vision. This technique involves the placement of a 0° laparoscope through a transparent optical port, which is tunnelled into the abdomen under vision. The port is advanced with a twisting motion while the camera is held steady. The layers of the abdominal wall musculature are seen. When the peritoneal cavity (distended beforehand using the Veress needle) is entered the omentum and intra-abdominal viscera are seen and a gush of air is heard and felt. The 0° camera is subsequently replaced with an appropriate 30° camera if required. It is also common practice to use the optical entry method without prior insufflation using a Veress needle. The basic principles of secondary port (trocar) placement in laparoscopic surgery are as follows: 1 All secondary trocars should be inserted under direct vision to avoid damage to bowel, bladder and blood vessels. A two-handed or controlled single-handed technique should be used to avoid sudden movement, resulting in plunging of the trocar intraperitoneally. 2 Trocars should always be inserted perpendicular to the abdominal wall. Oblique insertion results in increased pressure or torque while instruments are used, which causes fatigue for the surgeon and increased trauma to the patient's abdominal wall.

This is of particular relevance in obese patients. 3 A hand's breadth (the patient's hand) either side of the midline represents the extent of the rectus sheath, which contains the epigastric vessels. By placing non-midline trocars lateral to the rectus sheath, usually in the mid clavicular line, the epigastric vessels can be avoided. 4 Where possible, smaller diameter trocars should be used as they are associated with less postoperative pain, a lower incidence of port site incisional hernia and better cosmesis. All port sites above 5 /uni00A0 mm in diameter should undergo suture closure of the fascial layers to reduce the possibility of port site hernia. 5 All secondary trocars should be removed under direct vision to observe for port site bleeding. Summary box 7.5 The benefits of laparoscopic surgery /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF

Less postoperative pain Better cosmesis Earlier return to normal physiology Shorter hospital stays Fewer intraoperative adhesions created Better perception of anatomy as image is often magni /f_i ed

Laparoscopic access and port placement

There are two fundamental ways to access the abdomen laparoscopically: - 1 the open technique (Hasson's or modified Hasson's) 2 the closed technique (V erness needle and/or visual entry trocar). The advantages and complication rates of each of these techniques are not significantly di ff erent; therefore, the tech - nique that the surgeon is most accustomed to should be used. Figure 7.9 (a) (b) (d) (c) (e)

(a) (b) (d) Midline laparotomy incision. Skin incision; /uni00A0 peritoneum is picked up between haemostats and incised; (c) (e) subcutaneous fat is incised; linea alba is opened to expose peritoneum; peritoneal cavity opened (courtesy of Dr Vinay Timothy Kuruvilla).

Figure 7.10 (a) (b) (c) (d) (e)

(c) (e) (d) Laparoscopic access to the abdomen using the mod

i /f_i ed Hasson's technique. Umbilicus everted, revealing the stalk of the umbilicus. Periumbilical skin incision. The junction of the umbilicus and linea alba is identi /f_i ed and opened longitudinally. A curved haemostat used to break the peritoneum, which is then stretched open. A blunt-tipped primary trocar is inserted.

with both techniques to provide access as directed by circum stances such as pregnancy , scars from previous operations or as dictated by disease pathology . Blind trocar insertion with or without V erness needle insuf flation is avoided. Open Hasson's technique for laparoscopic primary trocar insertion In most cases, the umbilicus is the preferred site for a 10–12-mm initial port placement (Figure 7.10a–e). 1 The umbilical cicatrix is everted with a toothed tissue- grasping forceps. It is important to grasp the cicatrix directly as this is closest to the adherent peritoneum. Counter-

traction is maintained throughout the subsequent steps until the primary trocar is inserted. 2 The umbilical stalk is palpated inferior to the everted cicatrix while maintaining cephalad traction. 3 A curved 10–12-mm transverse incision is made inferior to the cicatrix. 4 The umbilical stalk is exposed with sharp and blunt dissection to reveal the decussation (crossing) of fibres just above its junction with the linea alba. 5 A 5-mm vertical incision is made through the decussation with an 11-blade scalpel, taking care only to incise the fascia at this point and not to enter the peritoneum. 6 A blunt haemostat angled away from the bowel and major vessels is then pushed through the pre-peritoneal fat and peritoneum; the surgeon will feel a ‘pop’ as the instrument enters the peritoneal cavity. 7 A blunt-tipped 10- or 12-mm trocar is pushed through the same point of insertion of the haemostat and in the same direction. 8 The laparoscopic camera is used to confirm successful placement in the peritoneal cavity before insufflation with CO gas. 9 CO gas insufflation is commenced at low flow (1–4 litres per minute) and increased to a maximum pressure of 15 mmHg and with a maximum flow rate of 20 L/min. 10 For the patient with scars from previous abdominal surgery, the safest technique is an open approach at Palmer’s point, 3 cm below the left subcostal margin in the mid-clavicular line. Adequate lighting and good assistance with retraction are essential. Veress needle and optical entry A Veress needle is a spring-loaded needle that consists of an outer sharp bevel that cuts through tissue. Once the needle enters the peritoneal cavity, owing to the loss of resistance the spring-loaded blunt inner stylet deploys and prevents inadvertent injury to the bowel or blood vessels. The Veress needle can be inserted in the umbilical region or in other regions of the abdomen, such as Palmer’s point. The steps involved in Veress needle insertion are as follows (Figure 7.11). Raol Palmer, 1904–1945, gynaecologist, France. - - - - Figure 7.11 1 A 10-mm incision in Palmer’s point (3 cm below the left costal margin, in the mid-clavicular plane) is the location preferred by many surgeons for Veress needle insertion. 2 The needle is advanced until it reaches the muscle. The abdominal wall is then lifted and the needle advanced through the oblique muscles. 3 Classically, a ‘pop’ is heard and a ‘give’ felt on successful insertion into the peritoneal cavity. 4 The intraperitoneal placement is confirmed using a combination of the following techniques. The hanging drop method, wherein a drop of water is placed in the hub of the needle; on elevating the abdominal wall the resultant loss of intra-abdominal pressure would result in the drop emptying into the abdominal cavity. Free flow of saline into the peritoneal cavity and no return of bowel content or blood on aspiration. Abdominal pressure reading of less than 10 mmHg. 5 Once the position is confirmed CO insufflation at a slow pace is commenced until the target pressure is reached. The needle is now removed.

(c) (b) Veress needle to establish pneumoperitoneum (courtesy of Dr Vinay Timothy Kuruvilla).

flation: The primary port is placed by following the Veress needle track. A visual entry port is recommended as it allows for a more controlled entry under vision. This technique involves the placement of a 0° laparoscope through a transparent optical port, which is tunnelled into the abdomen under vision. The port is advanced with a twisting motion while the camera is held steady. The layers of the abdominal wall musculature are seen. When the peritoneal cavity (distended beforehand using the Veress needle) is entered the omentum and intra-abdominal viscera are seen and a gush of air is heard and felt. The 0° camera is subsequently replaced with an appropriate 30° camera if required. It is also common practice to use the optical entry method without prior insufflation using a Veress needle. The basic principles of secondary port (trocar) placement in laparoscopic surgery are as follows: 1 All secondary trocars should be

inserted under direct vision to avoid damage to bowel, bladder and blood vessels. A two-handed or controlled single-handed technique should be used to avoid sudden movement, resulting in plunging of the trocar intraperitoneally. 2 Trocars should always be inserted perpendicular to the abdominal wall. Oblique insertion results in increased pressure or torque while instruments are used, which causes fatigue for the surgeon and increased trauma to the patient's abdominal wall. This is of particular relevance in obese patients. 3 A hand's breadth (the patient's hand) either side of the midline represents the extent of the rectus sheath, which contains the epigastric vessels. By placing non-midline trocars lateral to the rectus sheath, usually in the mid clavicular line, the epigastric vessels can be avoided. 4 Where possible, smaller diameter trocars should be used as they are associated with less postoperative pain, a lower incidence of port site incisional hernia and better cosmesis. All port sites above 5 /uni00A0 mm in diameter should undergo suture closure of the fascial layers to reduce the possibility of port site hernia. 5 All secondary trocars should be removed under direct vision to observe for port site bleeding. Summary box 7.5 The benefits of laparoscopic surgery /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF

Less postoperative pain Better cosmesis Earlier return to normal physiology Shorter hospital stays Fewer intraoperative adhesions created Better perception of anatomy as image is often magnified

Laparoscopic access and port placement

There are two fundamental ways to access the abdomen laparoscopically: - 1 the open technique (Hasson's or modified Hasson's) 2 the closed technique (Veress needle and/or visual entry trocar). The advantages and complication rates of each of these techniques are not significantly different; therefore, the technique that the surgeon is most accustomed to should be used. Figure 7.9 (a) (b) (d) (c) (e)

(a) (b) (d) Midline laparotomy incision. Skin incision; /uni00A0 peritoneum is picked up between haemostats and incised; (c) (e) subcutaneous fat is incised; linea alba is opened to expose peritoneum; peritoneal cavity opened (courtesy of Dr Vinay Timothy Kuruvilla).

Figure 7.10 (a) (b) (c) (d) (e)

(c) (e) (d) Laparoscopic access to the abdomen using the mod

ified Hasson's technique. Umbilicus everted, revealing the stalk of the umbilicus. Periumbilical skin incision. The junction of the umbilicus and linea alba is identified and opened longitudinally. A curved haemostat used to break the peritoneum, which is then stretched open. A blunt-tipped primary trocar is inserted.

with both techniques to provide access as directed by circumstances such as pregnancy, scars from previous operations or as dictated by disease pathology. Blind trocar insertion with or without Veress needle insufflation is avoided. Open Hasson's technique for laparoscopic primary trocar insertion

In most cases, the umbilicus is the preferred site for a 10–12-mm initial port placement (Figure 7.10a–e).

- 1 The umbilical cicatrix is everted with a toothed tissue-grasping forceps. It is important to grasp the cicatrix directly as this is closest to the adherent peritoneum. Counter-traction is maintained throughout the subsequent steps until the primary trocar is inserted.
- 2 The umbilical stalk is palpated inferior to the everted cicatrix while maintaining cephalad traction.
- 3 A curved 10–12-mm transverse incision is made inferior to the cicatrix.
- 4 The umbilical stalk is exposed with sharp and blunt dissection to reveal the decussation (crossing) of fibres just above its junction with the linea alba.
- 5 A 5-mm vertical incision is made through the decussation with an 11-blade scalpel, taking care only to incise the fascia at this point and not to enter the peritoneum.
- 6 A blunt haemostat angled away from the bowel and major vessels is then pushed through the pre-peritoneal fat and peritoneum; the surgeon will feel a 'pop' as the instrument enters the peritoneal cavity.
- 7 A blunt-tipped 10- or 12-mm trocar is pushed through the same point of insertion of the haemostat and in the same direction.
- 8 The laparoscopic camera is used to confirm successful placement in the peritoneal cavity before insufflation with CO gas.
- 9 CO gas insufflation is commenced at low flow (1–4 litres per minute) and increased to a maximum pressure of 15 mmHg and with a maximum flow rate of 20 L/min.
- 10 For the patient with scars from previous abdominal surgery, the safest technique is an open approach at Palmer's point, 3 cm below the left subcostal margin in the mid-clavicular line. Adequate lighting and good assistance with retraction are essential.

Veress needle and optical entry

A Veress needle is a spring-loaded needle that consists of an outer sharp bevel that cuts through tissue. Once the needle enters the peritoneal cavity, owing to the loss of resistance the spring-loaded blunt inner stylet deploys and prevents inadvertent injury to the bowel or blood vessels. The Veress needle can be inserted in the umbilical region or in other regions of the abdomen, such as Palmer's point. The steps involved in Veress needle insertion are as follows (Figure 7.11).

Raol Palmer, 1904–1945, gynaecologist, France.

- 1 A 10-mm incision in Palmer's point (3 cm below the left costal margin, in the mid-clavicular plane) is the location preferred by many surgeons for Veress needle insertion.
- 2 The needle is advanced until it reaches the muscle. The abdominal wall is then lifted and the needle advanced through the oblique muscles.
- 3 Classically, a 'pop' is heard and a 'give' felt on successful insertion into the peritoneal cavity.
- 4 The intraperitoneal placement is confirmed using a combination of the following techniques.
 - The hanging drop method, wherein a drop of water is placed in the hub of the needle; on elevating the abdominal wall the resultant loss of intra-abdominal pressure would result in the drop emptying into the abdominal cavity.
 - Free flow of saline into the peritoneal cavity and no return of bowel content or blood on aspiration.
 - Abdominal pressure reading of less than 10 mmHg.
- 5 Once the position is confirmed CO insufflation at a slow pace is commenced until the target pressure is reached.

The needle is now removed.

(c) (b) Veress needle to establish pneumoperitoneum (courtesy of Dr Vinay Timothy Kuruvilla).

The primary port is placed by following the Veress needle track. A visual entry port is recommended as it allows for a more controlled entry under vision. This technique involves the placement of a 0° laparoscope through a transparent optical port, which is tunnelled into the abdomen under vision. The port is advanced with a twisting motion while the camera is held steady

. The layers of the abdominal wall musculature are seen. When the peritoneal cavity (distended beforehand using the Veress needle) is entered the omentum and intra-abdominal viscera are seen and a gush of air is heard and felt. The 0° camera is subsequently replaced with an appropriate 30° camera if required. It is also common practice to use the optical entry method without prior insufflation using a Veress needle. The basic principles of secondary port (trocar) placement in laparoscopic surgery are as follows: 1 All secondary trocars should be inserted under direct vision to avoid damage to bowel, bladder and blood vessels. A two-handed or controlled single-handed technique should be used to avoid sudden movement, resulting in plunging of the trocar intraperitoneally. 2 Trocars should always be inserted perpendicular to the abdominal wall. Oblique insertion results in increased pressure or torque while instruments are used, which causes fatigue for the surgeon and increased trauma to the patient's abdominal wall. This is of particular relevance in obese patients. 3 A hand's breadth (the patient's hand) either side of the midline represents the extent of the rectus sheath, which contains the epigastric vessels. By placing non-midline trocars lateral to the rectus sheath, usually in the mid clavicular line, the epigastric vessels can be avoided. 4 Where possible, smaller diameter trocars should be used as they are associated with less postoperative pain, a lower incidence of port site incisional hernia and better cosmesis. All port sites above 5 mm in diameter should undergo suture closure of the fascial layers to reduce the possibility of port site hernia. 5 All secondary trocars should be removed under direct vision to observe for port site bleeding. Summary box 7.5 The benefits of laparoscopic surgery

Less postoperative pain Better cosmesis Earlier return to normal physiology Shorter hospital stays Fewer intraoperative adhesions created Better perception of anatomy as image is often magnified

Revision #1

Created 2025-12-31 15:25:59 UTC by Omar Ayman

Updated 2025-12-31 15:25:59 UTC by Omar Ayman