Trocar Placement - Post-Test

1. Which is an absolute contraindication for performing diagnostic laparoscopy?
    a. Abdominal compartment syndrome
    b. Uncorrected coagulopathy
    c. Refractory hemodynamic instability
    d. All of the above

Explanation: Absolute contraindications to laparoscopy include refractory hemodynamic instability of any origin, overt peritonitis with gross intrabdominal contamination, intrabdominal visceral/vascular injuries following trauma, abdominal compartment syndrome, shock, evisceration, abdominal wall dehiscence, and uncorrected coagulopathy.
The presence of extensive abdominal adhesions from a prior surgery and recent laparotomy within 4-6 weeks is a relative contraindication to laparoscopy, however it is not absolute. Other relative contraindications to laparoscopy are acute intestinal obstruction with dilated bowel > 4 cm, pregnancy, obesity, infections of the anterior abdominal wall, and cardiopulmonary compromise.

2. What is the proper positioning of a patient undergoing diagnostic laparoscopy of the pelvis?
    a. Supine position, Trendelenburg, both arms tucked
    b. Supine position, reverse Trendelenburg, both arms abducted
    c. Prone position, Trendelenburg, both arms tucked
    d. Prone position, reverse Trendelenburg, both arms abducted

Explanation: Positioning is a key element in the success of any laparoscopic surgery and is determined by the diagnosis and anticipated procedure. Optimal patient positioning should provide easy access to the operation field for port placement, surgery, and circulation of team members. Proper positioning should also guard against any injuries to soft tissue or nerves and prevent unexpected falls or unwanted patient movements. This includes use of straps, pressure area pads and bracing supports.
For a diagnostic laparoscopy of the pelvis;
The supine position is the most used position in laparoscopy as it provides access to the neck abdomen and groin areas.
The Trendelenburg position lends retraction of the intra-abdominal organs away from the pelvis. Overall, modifications like Trendelenburg, reverse Trendelenburg, left or right tilt make use of gravity to provide retraction of viscera.
Both arms tucked to the patient's side allows the surgeon and assistant to get closer to the patient.
Other patient positions include; prone position which provides access to the retroperitoneum when a dorsal approach is desired. Lateral decubitus position provides access to the chest and

retroperitoneum.
Low lithotomy modification is favored for pelvic pathologies and split legs provide midline access as they allow the surgeon to stand in-between the patient's legs.

3. Which of the following statements is true regarding the Hasson (open) technique compared to the Veress (closed) technique for peritoneal access and trocar placement?
    a. Hasson technique reduces the overall length of the procedure
    b. Hasson technique results in a smaller fascial defect
    c. Hasson technique allows direct visualization of the abdominal wall
    d. Hasson technique is less useful in patients with abdominal wall adhesions

Explanation: The Veress method refers to a closed method in which the Veress needle is used to puncture through the layers of the abdominal wall. It is advantageous due to the short amount of time needed for the procedure but carries a higher risk of major vascular and viscus injury. The Hasson method refers to an open method in which an incision (usually periumbilical) is made through the abdominal wall under direct visualization. It allows increased safety due to direct visualization of all layers of the abdominal wall; however, it requires a longer operation time and results in a larger fascial defect. The Hasson method is more useful in patients with abdominal wall adhesions due to the direct visualization of the abdominal wall.

4. What is the standard insufflation pressure of pneumoperitoneum for a standard transabdominal laparoscopic procedure in adults?
    a. 5 mmHg
    b. 10 mmHg
    c. 15 mmHg
    d. 20 mmHg

Explanation: A pressure of 15 mmHg is commonly used, allowing sufficient insufflation without compromising respiration or hemodynamics in a patient with normal cardiovascular reserve. Lower pressures can make it difficult to achieve adequate working space and view, and higher pressures can create concern for compromising hemodynamics. However, in patients with abnormal reserve or in pediatric patients, the optimal pressures may differ.

5. During diagnostic laparoscopy of the pelvis, you notice a copious amount of blood expanding in the retroperitoneum. The anesthesiologist tells you that the patient remains stable. How would you proceed?
    a. Continue with exploration of the ovaries and tubes
    b. Convert to open surgery to explore for source of bleeding
    c. Increase pneumoperitoneum to 25 mmHg
    d. Insert an additional trocar to assist identification of bleeding source

Explanation: Large vessel lacerations cannot generally be repaired laparoscopically. The safest approach would be to perform an exploratory laparotomy through a midline incision. The bleeding can be controlled and repaired directly in an open fashion. As expertise in laparoscopy is accrued and appropriate instrumentation is available, these injuries may be able to be addressed laparoscopically. However, the safest, most generalizable approach to complications of laparoscopic entry is through conventional open surgery.

6. You begin diagnostic laparoscopy and insufflate the abdominal cavity with CO2. The insufflation process should be halted if the patient develops:
    a. Rise in peak airway pressure
    b. Hypertension
    c. Tachycardia
    d. Lower extremity edema

Explanation: Upon insufflation, if the patient acutely develops significantly increased peak airway pressures, hypotension, and oxygen desaturation, it is likely a sign of a tension pneumothorax. Tension pneumothorax is one of the most common complications of laparoscopy and is due to pneumoperitoneum in patients with unexpected diaphragmatic injuries. This condition can be treated with the suture of the diaphragmatic injury and placement of a thoracostomy tube.

7. What is the most common site for an initial port placement to perform a laparoscopic appendectomy?
    a. In left lower quadrant
    b. At midline abdomen
    c. At medial costal margin
    d. At the umbilicus

Explanation: Laparoscopic access is commonly performed at the umbilicus. Alternative access sites should be considered in the presence of periumbilical adhesions, umbilical or ventral hernia, pregnancy, large pelvic mass, obesity, or extreme abdominal wall laxity. Under these circumstances, a non-umbilical access site may be preferred. Common alternative entry sites include the left costal margin, the midline abdomen, and the hypogastric region. Non-abdominal access sites are rarely used.

8. What is the immediate next step following successful entry into the abdominal cavity using an open technique?
    a. Insert stay sutures in the fascial edges of the incision
    b. Perform a finger sweep on the underside of the abdominal wall

c. Place the trocar through the incision and secure
d. Insufflate the abdomen to establish pneumoperitoneum

Explanation: The Hasson technique is an open method in which an incision is made through the abdominal wall with direct visualization of all the layers of the abdominal wall during entry. To access the peritoneal cavity using an open technique, make an incision in the skin. Dissect apart the subcutaneous fat and tissues using narrow retractors or a Kelly hemostat. Incise the fascia until a small amount of preperitoneal fat is identified and place stay sutures in the fascial edges. Dissect the remaining preperitoneal fat. The peritoneum is opened, and a finger sweep is immediately performed with the index finger to confirm location and absence of adhesions. Following a clear finger sweep, the trocar can be placed and secured with stay sutures. The abdomen is insufflated following placement of the trocar.

9. The patient develops bradycardia during laparoscopic insufflation of the abdomen. What is the appropriate next step?
    a. Desufflation of the abdomen
    b. Administration of vagolytic agents
    c. Volume replacement
    d. All of the above

Explanation: The most common arrhythmia that occurs during laparoscopic insufflation is bradycardia. A rapid stretch of the peritoneal membrane often causes a vasovagal response with bradycardia and occasionally hypotension. The appropriate management of this event is desufflation of the abdomen, administration of vagolytic agents (e.g., atropine), and adequate volume replacement.

10. Which of the following conditions is ***least*** likely to require non-umbilical trocar placement?
    a. Previous umbilical trocar placement
    b. Ventral hernia repair
    c. Periumbilical piercings
    d. Postpartum tubal ligation
    e. Severe abdominal wall laxity

Explanation: Certain conditions increase the risk of complications with umbilical entry and are candidates for non-umbilical access sites. Extreme abdominal wall laxity may be a contraindication for umbilical trocar placement. Prior periumbilical incisions (i.e., postpartum tubal ligation, prior laparoscopy, and ventral hernia repair) increased risk of adhesions to the anterior abdominal wall. Periumbilical tattoos and jewelry do not cause adhesions and do not prevent umbilical trocar placement, however umbilical jewelry should be removed prior to surgery.