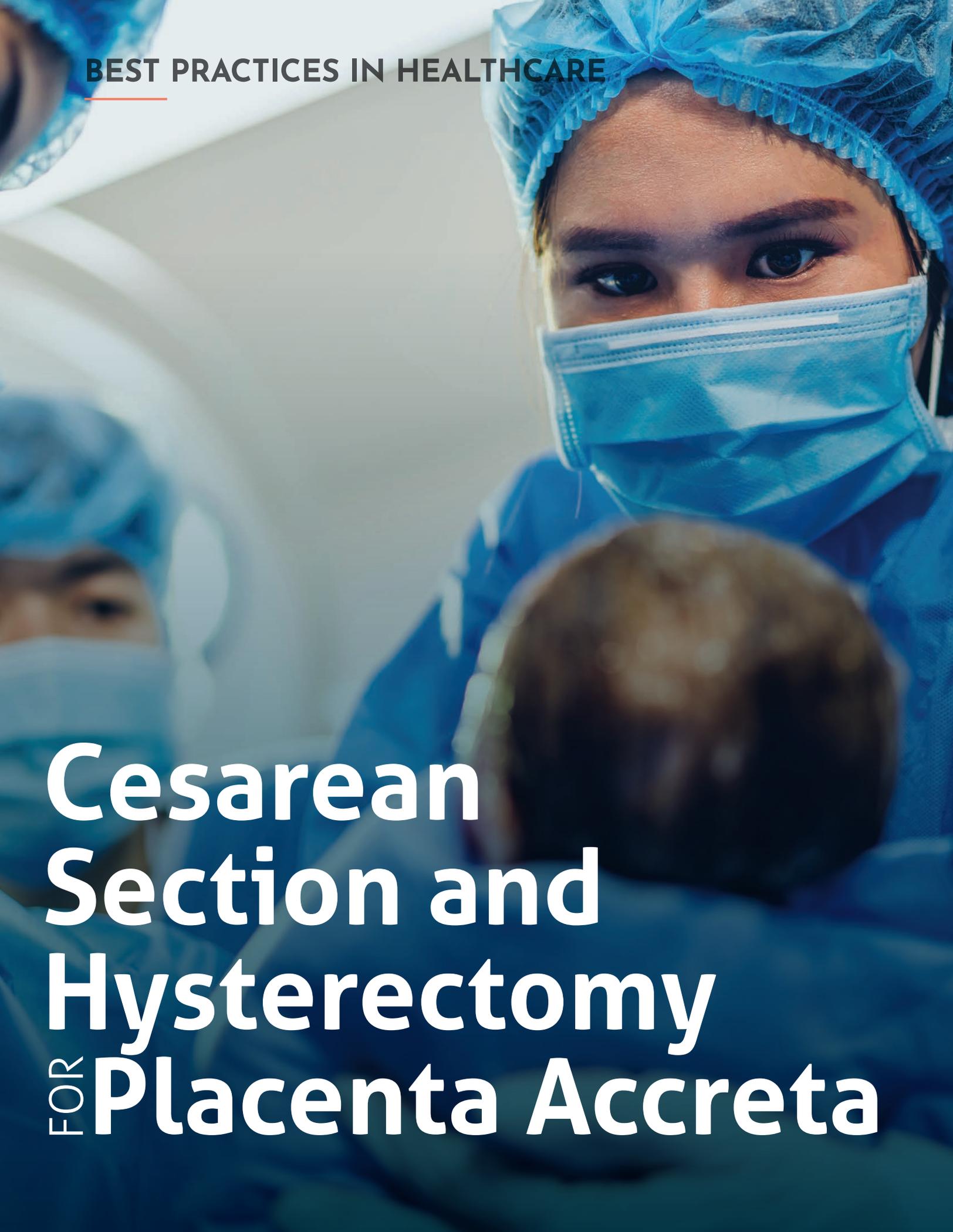


BEST PRACTICES IN HEALTHCARE



Cesarean Section and Hysterectomy FOR Placenta Accreta



TIFFANY BRUNO
OKLAHOMA CITY COMMUNITY COLLEGE

Cesarean Section and Hysterectomy

A 34-year-old female with a height of 65 inches and weighing 104.32 kg is in the 35th week of her fourth pregnancy presented to the OR with noticeable vaginal bleeding. Her previous pregnancies ended with cesarean sections, designating the fourth pregnancy as high risk. During her 20-week ultrasound, the patient was found to have placenta accreta, thought to have occurred due to the scar tissue from her previous cesarean sections. She does have diabetes myelitis type 2 and is obese, but there is no other significant medical history outside of her previous cesarean sections. Additionally, the preoperative assessment notes no known allergies. With the patient's predisposition for high blood pressure and glucose, her diabetes and blood pressure were closely monitored throughout the pregnancy. Based on the information presented previously and risk of hemorrhage the anesthesia care team designated her as an ASA III. ASA III designation is given to patients who present to the operating room with a "severe systemic disease" and more specifically to this particular patient, persons limited by diabetes myelitis, high insulin requirements, and obesity (BMI >40) (ASA, 2020).

Placenta Accreta

Placenta Accreta is defined as an serious obstetrical complication; where the placenta will attach itself to the uterine wall, usually occurring in week 12 of the pregnancy. In placenta accreta cases, the implantation goes beyond the endometrium, the inner epithelial layer, and the mucous membrane in the uterus (Pardo and Miller 575). There are three stages to placenta accreta, each with varying severity and danger (Pardo and Miller 575). The first iteration of placenta accreta is vera, during which the placenta is implanted and adhered to the myometrium (Pardo and Miller 575). This is the least severe of the three, and though it should still be monitored, it is not as dangerous as the other two. However, it can still cause massive bleeding. The second presentation of accreta is referred to as placenta increta, during which the implantation begins to merge into the myometrium, resulting in the entwinement of the placental vasculature and uterine vasculature (Pardo and Miller 575). This makes detachment of the placenta even more dangerous, and monitoring throughout the pregnancy is vital. The last presentation, and most severe version of

NORMAL PLACENTA VS. PLACENTA ACCRETA SPECTRUM (PAS)



NORMAL PREGNANCY

The placenta attaches to a temporary layer in the uterus that's shed at delivery



PLACENTA ACCRETA

When the placenta attaches too deeply into the uterine wall



PLACENTA INCRETA

When the placenta attaches into the uterine muscle



PLACENTA PERCRETA

When the placenta goes completely through the uterine wall, sometimes invading nearby organs like the bladder

placenta accreta, is placenta percreta, which is the placenta's penetration through the total thickness of the myometrium (Pardo and Miller 575). With placenta percreta, the patient is at severe risk of placental implantation on the bowel, bladder, ovaries, or other pelvic organs and vessels, which can propagate a life-threatening hemorrhage (Pardo and Miller 575-576).

The rate of placenta accreta occurs more frequently in association with placenta previa (the abnormal implantation of the placenta in front of the presenting fetus), occurring in 1 in 533 pregnancies (Pardo and Miller 574-576). Additionally, placenta accreta formation increases in those with previous cesarean sections. Pardo and Miller (2018) note 11% incidence rate after the first uterine incision, 40% rate after two uterine incisions, and 60% in those with three or more (Pardo and Miller 576). As this was the patient's fourth c-section, it was determined that the patient's previous surgical interventions were the underlying cause of the placenta accrete. Ahead of her fourth cesarean section, her care team determined she had placenta increta, which, as previously stated, indicated a moderate risk of hemorrhage.

Since it is attached to the previous scar tissue, the placenta was located in the lower section of the uterus, causing a possible placenta previa and making it impossible for the baby to pass through the vaginal canal. The placenta accreta makes the myometrium susceptible to tearing when attempts to remove the placenta are made. Placenta accreta does not

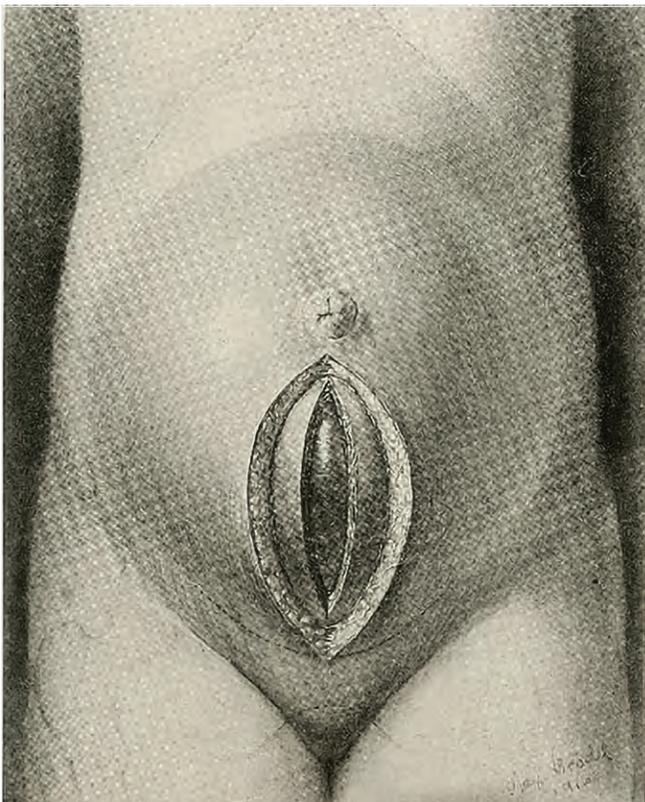
usually have any outlining indications and sometimes does not present more than bleeding during the last few weeks of pregnancy. Due to the risk of uncontrollable bleeding during natural labor, it is recommended that the mother go in for a cesarean section during the 34 to 38 weeks of pregnancy (Placental Accreta, Increta and Percreta 2022).

Surgery

Cesarean sections are recommended for patients who fail to progress in labor, breech presentations, and specific medical indications, such as placenta previa, abruptio placenta, and uterine rupture (Jaffe et al. 927). There is an 12% increased risk of a uterine rupture with any vaginal delivery following a cesarean section, and due to her diagnosed placenta accreta, a cesarean section will be required for this patient (Jaffe et al. 926). If natural birth is attempted, the baby would possibly not be able to advance due to the suspected placenta previa. The patient may also risk bleeding if the placenta tries to detach, so a hysterectomy is highly recommended, especially if the placenta is thoroughly embedded. These combined complications could cause massive bleeding in the patient and risk the patient's life and that of her baby.

This surgery is broken into two phases, requiring different techniques and having separate risks. For the first portion of the surgery, the only goal is to extract the neonate out safely with as minor bleeding as possible during the cesarean section. It should be noted that the patient's partner is allowed to remain with her during this portion of the surgery.

Generally, during a cesarean section, a horizontal incision is made into the lower abdomen and the lower uterine segment (Jaffe et al. 926). However, due to the patient's obesity and scheduled hysterectomy, a vertical incision was made. The incision runs from the upper portion of the abdomen down to the lower part of the abdomen towards the lower uterine segment. It is important to note that the anesthetic delivery is done in two parts, with the first part being neuraxial anesthesia. During the cesarean section, the patient is kept awake to prevent the transmission of anesthetic agents to the fetus (Pardo and Miller 558-559). Once the incision is made through the abdominal muscles and the uterine wall is reached, a vertical incision is made into the uterus, exposing the amniotic sac (Cesarean section 2019). The amniotic sac is then opened, the baby is delivered, the umbilical cord is cut, and the amniotic sac and fluid are removed (Cesarean section 2019). Usually, the placenta is removed during cesarean sections; however, since a hysterectomy is required with the placenta accreta diagnosis, the placenta will remain attached to the uterus, which is then sewn shut to prepare for the second phase.



After removing the neonate, making sure they are healthy and closing the uterus, the surgeons prepare for phase two of the procedure. It is at this time, the husband is escorted from the OR, and the second mode of anesthesia

is delivered. The patient is put under general anesthesia, where removing the uterus and fallopian tubes begins. A self-retaining retractor is placed while the round, ovarian, and broad ligaments are clamped, cut, and tied (Jaffe et al. 910). The uterine vessels are then ligated, followed by the uterosacral and cardinal ligaments (Jaffe et al. 910). Finally, the vaginal cuff is closed to incorporate the uterosacral ligaments for pelvic support (Jaffe et al. 910). The abdomen is then searched for excessive bleeding or punctures to other organs; once cleared, the visceral peritoneum can be adjusted, and closure can begin (Jaffe et al. 910). The retractors are then removed, the layers of muscle are sewn back in place, the Tegaderm is firmly placed over the incision, and the patient is sent off to recovery.



Equipment and Implications

As an anesthesia technologist, it is vital to understand the pathophysiology of obstetrical care. For these reasons, preparation of the room included setting up a Miller 2 blade, video laryngoscope, and having access to a fiberoptic bronchoscope. Pardo and Miller (2018) note that a Miller 2 blade should be set up in predicted difficult intubation of obese and pregnant patients as the resulting airway edema makes visualization of the airway difficult (Pardo and Miller

556). A Miller-2 blade is desirable for direct laryngoscopy during difficult intubation in obese and pregnant patients as it creates a better visualization of the vocal cords. It directly lifts the tongue and epiglottis out of the way and leaves a direct view of the vocal cords (Dorsch and Dorsch 314). During an assessment of the patient, the anesthesiologist could see that the patient had a Mallampati score of III, meaning that he could barely visualize the soft palate and just the top of the uvula. Prior to the transportation to the operating room, the preop nurse placed an 18 gauge IV in her left arm. Once in the operating room, the patient, under the direction of the operating room team, transferred herself to the operating table.



Airway pictures prelabor (Samssoon modification of Mallampati class 1 airway; A) and postlabor (Samssoon modification of Mallampati class 3 airway; B).

Once on the table, the patient was placed supine, and a nasal cannula was placed on her for the first phase of the procedure. A blood pressure cuff was placed on her left arm,

and the pulse oximeter was placed on her left middle finger while her right arm was prepared to put an arterial line. As her blood pressure and oxygen levels were being read, a 5-lead EKG was also placed to measure her heart's electrical signals, and a skin temperature probe was placed on her forehead.

After ensuring that all monitors were placed, the anesthesiologist numbed the area where they would put the arterial line. He then sterilely placed the catheter into the patient's right radial artery to get consistent blood pressure readings throughout the procedure (Pardo and Miller 352). This is especially important when you have a high risk of bleeding during the surgery. This can help detect a significant drop in blood pressure (Pardo and Miller 352). Having an arterial line placed makes it significantly easier to aspirate and draw blood directly from the line to run a blood-gas analysis (BGA) and glucometer (Guimaraes et al. 354). A BGA is a device that takes a sample of arterial blood and runs it through a machine that pulls measurements of the patient's different levels in their bodies, including oxygen saturation, pH, and electrolyte levels (Pardo and Miller 367). The glucometer is a device that can measure the patient's glucose levels throughout the procedure (Guimaraes et al. 354). Since the patient has diabetes, running a constant glucometer can help ensure that the anesthesiologist is always aware of the patient's sugar levels during surgery. Since blood loss is an exceptionally high risk due to the placenta increta, a Belmont and Cell Saver is put on standby if needed, and blood is kept in a cooler nearby (Guimaraes et al. 655).

After the arterial line is placed, the patient is sat up and prepared for a combined spinal and epidural. The anesthesia technologist sterilely placed the drape on her back and has her hunch her shoulders to make her spine more open for the procedure (Pardo and Miller 562). The epidural is the first one placed, during which a Tuohy needle is pushed through to the epidural space, going between the vertebral spinous processes in the back, leaving behind a catheter for the continuous medication (Pardo and Miller 562). A spinal is then placed to start the procedure more quickly and is placed similarly to the epidural; however, the spinal goes into the spinal column into the cerebral spinal fluid, letting it act quicker (Pardo and Miller 563). With the epidural and spinal placed, she is put back into the supine position with her husband at the head of the operating table, and the first phase of the surgery is started.

Once the baby was removed from the uterus and deemed

safe, the husband was then escorted out of the operating room with the baby. After anesthetizing the patient, the anesthesiologist grabs the video laryngoscope and quickly places the 7.0 mm ETT for the following hysterectomy. Once the ETT was placed at 23 cm, the temperature probe was changed to that of an esophageal probe to have a more accurate reading. Once they began the second phase of the surgery, the anesthesiologist prepared her upper right arm for a peripherally inserted central catheter (PICC). A PICC is a central line catheter placed through a vein in the upper arm, advancing to the heart (Peripherally inserted central catheter (PICC) line 2021). This makes it so that they can transfuse blood quickly if needed.

Intraoperative Needs

Midazolam, a benzodiazepine, was given to the patient during preop to help her remain calm preoperatively prior to the OR and the cesarean section (Hitner et al. 233). Once in the OR, a 2% lidocaine was used to numb the right forearm for her arterial line placement. The 20-gauge catheter was then placed in the radial artery, and bupivacaine was used in the combined spinal and epidural anesthetic (Butterworth et al. 87). A scopolamine patch was seated behind her ears to help reduce nausea; however, they administered atropine, an anticholinergic, to stifle nausea because the patient was dealing with breakthrough nausea during the first phase of the surgery (Hitner et al. 535). Once all monitors were set, the patient had 1000 mL of 0.9% sodium chloride attached to her IV line, with rotating bags of packed red blood cells and fresh frozen plasma. In total, she was given four units of each blood product. The combined RBCs, FFP, and crystalloid units were satisfactory in controlling her bleeding. The patient was also given Pitocin, generally used after the delivery of the placenta, to help control the bleeding by causing uterine contractions (Hitner et al. 658).

Once the hysterectomy began, they administered the drugs to anesthetize the patient. First, 40 mg of lidocaine was issued so that it would blunt the burn from the 160 mg of propofol. Propofol is a milky-colored hypnotic used in most surgeries and follows with a burning sensation in the IV (Hitner et al. 232-234). The nondepolarizing muscle relaxant Rocuronium was then used to paralyze the patient to make intubation easier, followed by fentanyl for pain relief throughout the surgery (Hitner et al. 110). The tidal volume was kept at 500 TV throughout the second phase of the procedure, with 1.7 mac for the sevoflurane to keep the patient anesthetized. Towards the end of the procedure, the patient was placed on Ancef, an antibiotic, to prevent possible postoperative infection (Hitner et al. 673). Finally, she was slowly weaned off the sevoflurane and ensured that she could breathe independently before being extubated and sent to intensive care for further monitoring.

Conclusion

Despite the risk of significant complications, the surgery was successful, with no critical or abnormal intraoperative outcomes. Though they did puncture the bladder during

the hysterectomy, the surgical team was able to quickly assess the damage and correct the puncture prior to closure. With her having placenta accreta, she was at high risk for bleeding; fortunately, the bleeding was controlled with 8 total units of blood products. Though she did suffer from nausea throughout the first phase, it was easily deterred with atropine and a scopolamine patch. The surgery

went well for both the patient and her baby, and she was easily extubated and sent to the intensive care unit (ICU) for any possible complications post-procedure. 

"With her having placenta accreta, she was at high risk for bleeding; fortunately, the bleeding was controlled with 8 total units of blood products."

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Take the
QUIZ
On The Next Page

Continuing Education Quiz

To test your knowledge on this issue's article, provide correct answers to the following questions on the form below. Follow the instructions carefully.

1. What is the most severe iteration of Placenta Accreta?

- a. Placenta accreta
- b. Placenta vera
- c. Placenta increta
- d. Placenta percenta

2. According to Pardo and Miller, what laryngoscope blade should be set up if direct laryngoscopy is used?

- a. Miller-2
- b. Macintosh-3
- c. Polio-3
- d. D-Blade
- e. Cobalt

3. What is the rate of occurrence of placenta accrete in patients with two previous c-sections?

- a. 11%
- b. 30%
- c. 40%
- d. 60%

4. What definition fits an ASA-III designation?

- a. A patient with mild systemic disease
- b. A patient with severe systemic disease
- c. A patient with severe systemic disease that is a constant threat to life
- d. A moribund patient who is not expected to survive without the operation

5. A PICC is a central line catheter placed through a vein in the upper arm, advancing to the heart.

- a. True
- b. False

6. A scopolamine patch is not used to treat and reduce nausea.

- a. True
- b. False

7. Which medication is an anticholinergic agent?

- a. Atropine
- b. Propofol
- c. Midazolam
- d. Adenosine

8. Which obstetrical complication prevents vaginal birth due to the partial or complete occlusion of the vaginal canal?

- a. Placenta Accreta
- b. Placenta Previa
- c. Placenta abruptio
- d. Placenta vera

9. What obstetrical complication is described as the placental vasculature entwining in the uterine vasculature?

- a. Placenta accreta
- b. Placenta vera
- c. Placenta increta
- d. Placenta percenta

10. Patients at risk of uncontrollable bleeding during natural birth should be brought into the operating room for a c-section at 30-32 weeks of pregnancy.

- a. True
- b. False

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- 1: A B C D
- 2: A B C D E
- 3: A B C D
- 4: A B C D
- 5: A B
- 6: A B
- 7: A B C D
- 8: A B C D
- 9: A B C D
- 10: A B

Quiz 2 of 2

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