A patient in her late 70s, G6P6, with a history of surgery for small bowel obstruction due to ventral hernia mesh adhesions and further complicated with a small bowel fistula with need of reoperation presented months after with pelvic pain. CT scan showed a 7.5 cm hypodense mass involving the uterus (thickened endometrium or possibly a cystic or necrotic lesion). MRI of the pelvis showed a large cystic mass in the midline of the pelvis, most characteristic of a hematometra, and a left adnexal mass with a tubular serpiginous shape and signal characteristics of hematosalpinx. CA125 was elevated to 101.7. A pelvic exam revealed a stage II uterine prolapse with severe cervical stenosis.

Aiming to minimize surgical morbidity via an abdominal approach, a vaginal hysterectomy technique via transvaginal natural orifice transluminal endoscopic surgery (v NOTES) using a single-port Intuitive robotic platform was offered. The feasibility and safety of this approach were previously described using the (Xi) Intuitive robotic platform.1–5 Informed consent was obtained, including permission for off-label use of a single-port robotic-assisted platform, acknowledgment of the limited surgical experience using this approach, and authorization for the procedure to be videoed for educational purposes.

The procedure was initiated with a classical vaginal surgery approach by performing a circumsection of the cervix followed by the opening of the anterior and posterior peritoneum and the transection and ligation of bilateral uterosacral ligaments and cardinal ligaments. A v NOTES port was inserted transvaginally into the peritoneal cavity to create a pneumoperitoneum. The hysterectomy and bilateral salpingo-oophorectomy with lysis of adhesions were performed via transvaginal NOTES using the surgical single-port Intuitive robotic platform. Once the procedure was completed, the colpotomy was closed as in the classical vaginal surgery approach.

The duration of the surgical procedure was 114 min with an estimated blood loss of 20 cc. The final pathology was negative for hyperplasia or malignancy. The postoperative course was unremarkable, with a length of stay of 1 day and a pain score of 0 to 5.

Conclusion: Robotic single-port transvaginal NOTES in patients with a history of complex abdominal surgery is challenging but feasible with the potential of reducing the risk of intestinal and abdominal wall complications that are almost guaranteed via a conventional laparoscopic or laparotomy abdominal approach. The advantages of articulating instrumentation and three-dimensional visualization are especially pivotal in complex transvaginal NOTES surgery.

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REFERENCES


Video Still Image Legend:
“Transvaginal view of the uterus in a hostile abdomen”

Video Caption:

This is DR. Antonio Santillan-Gomez from Texas Oncology in San Antonio, Texas, presenting a case of robotic single port-assisted transvaginal hysterectomy in a patient with a hostile abdomen.

This is the case of a patient in her late 70s presenting with persistent pelvic pain and a recent history of surgery for small bowel obstruction due to adhesions to a ventral hernia mesh, which was posteriorly complicated with a post-operative small bowel fistula with the need for reoperation and abdominal wound complications.

Pre-operative imaging was suspicious for a cystic or necrotic endometrial lesion. In addition to a left hydrosalpinx. The patient had a highly elevated ca-125. On physical examination, the patient had a uterine prolapse and cervical stenosis, making it difficult to perform an endometrial biopsy. Aiming to minimize surgical morbidity of an abdominal approach, a hysterectomy technique via transvaginal natural orifice transluminal endoscopic surgery (vNOTES) using a single-port robotic surgery was offered. Adequate informed consent was obtained including off-label use of a robotic SP device in addition disclosure of limited experience with the robotic vaginal surgical approach was explained in detail.

Configuration of the operating room for a single-port robotic surgery included instrumentation for vaginal hysterectomy and a DaVinci single-port robotic surgical platform. Having the patient in dorsal lithotomy position, the procedures initiated by placing a Foley catheter.

Then, an injection of vasoconstricting agents or local anesthesia is performed. This is followed by a circumferential incision around the cervix at a cervical-vaginal junction using the scalpel or the monopolar cautery device. Sequentially the anterior aspect of the vaginal mucosa and the posterior aspect of the vaginal mucosa are grasped and tented up using sharp and blunt dissection in order to separate the vaginal mucosa from the cervical stroma.

The peritoneum is then identified, and the peritoneal cavity is entered sharply with scissors then a right angle or a Sims retractor can be placed anteriorly and posteriorly into the peritoneal cavity.

Then, bilateral uterosacral ligaments are clamped, transected, and suture ligated with zero Vicryl sutures and referred with a hemostat bilaterally. In a similar fashion, bilateral Cardinal ligaments are identified clamp transected and suture ligated with zero Vicryl sutures. Important to incorporate the anterior-posterior peritoneum to prevent bleeding.

This is followed by clamping transected and suture ligation of bilateral urine vessels. Attention is made to place a transvaginal access platform. Initially, a circumferential retractor will be placed for transvaginal access. This is achieved with the help of an introducer to help place the anterior and posterior ring of the retractor.

Then, a gel cap is placed after placing the single port robotic trocar in the mid portion and placing two additional lateral self-retaining sleeves for the assistant instruments. This could be suction, irrigation, or advanced bipolar energy. The patient is placed on steep Trendelenburg at 20 degrees, and the pelvis and abdomen are insulated with CO2 gas at a pressure of 10 or 12 millimeters of mercury. Attention is made to dock the Vinci single-port
robotic cart with the cart head pointing directly to the vaginal access port. This is followed by introducing the single port instruments, including a fully articulating endoscope with a 3D HD Vision. In addition to a grasper, monopolar scissors, and a bipolar grasper. The procedure is continued now at the robotic single port console by advancing instruments in a cephalic direction followed by triangulation of robotic instruments inside the pelvic cavity. This is achieved by creating a distance of the SP trocar away from the cervix in the vaginal canal.

In the assessment of the pelvic cavity, it is important to identify landmark structures and to restore pelvic anatomy if necessary. Identification of the fondus of the uterus, cervix, and broad ligament is performed as well as the transected uterine vessels and the pelvic sidewall.

Then, using the bipolar and monopolar cautery, the left broad ligament is cauterized and transected with direction to the uterine round ligament complex and the conical end of the fallopian tube. The left hydrosalpinx is identified and skeletonized using sharp and blunt dissection using the monopolar cautery device, lysing some of the adhesions and attachments.

Extensive lysis of adhesions is performed using a sharp and blunt dissection using the monopolar cautery device by separating the attachments of the uterus to the pelvic organs.

The left round ligament is identified, cauterized with the bipolar cautery, and transected with the monopolar cautery scissors in the usual fashion.

Opening of the retroperitoneal space is achieved using sharp and blunt dissection opening the pararectal and paravesical spaces with identification of the ureter and mobilization of the ureter of the broad ligament peritoneum. Again, proper time is performed to identify the ureter and the pelvic vessels during the dissection. Attention is made to isolate the left infundibulum pelvic ligament using the monopolar cautery device and identification of the ureter prior to coagulation with bipolar cautery and transaction with the monopolar cautery scissors. In addition. The infundibulum pelvic ligament is secure with a zero vicryl endoloop for further hemostasis.

The procedure is continued on the patient’s right side again by orienting the anatomy and identifying important landmarks. Continuation would be to proceed with bipolar/monopolar cautery along the broad ligament peritoneum and uterine vessels. Continuation with lysis of adhesions, mobilizing the adhered small bowel to the fondus of the uterus and to the left pelvic sidewall. The right ovary is identified as well as the round ligament.

The round ligament is transected, freeing up the ovary. Then the peritoneum on the right pelvic side wall is dissected. Keeping mobilizing the ovary, there’s the identification of the fimbria of the right fallopian tube, which was adhered to the right pelvic sidewall. The retroperitoneum is open for further identification of the pelvic vessels and ureter and further isolation of the right infundibulum pelvic ligament, which will be further characterized with the bipolar cautery and transected with the monopolar and again, secure with a vicryl endoloop suture for secure hemostasis.

The robotic portion of the procedure is completed. Specimen and instruments are retrieved, and the vagina opening (anterior and posterior), is closed with vicryl sutures.