Abbreviations: MIS, minimally invasive surgery; NOTES, natural orifice transluminal endoscopic surgery; R-NOTES, robotic natural orifice transluminal endoscopic surgery; SPL, single port laparoscopy; AUB-L, abnormal uterine bleeding due to uterine leiomyoma; TLH, total laparoscopic hysterectomy; BS, bilateral salpingectomy; LOA, lysis of adhesions

Background

Natural Orifice Transluminal Endoscopic Surgery (NOTES) involves accessing the abdominal cavity via a natural orifice. It provides easier access for the surgeon, has a reduced recovery times and decreases postoperative pain.

Objective: To present an initial experience with robotic natural orifice transluminal surgery (R-NOTES) in gynecology using the da Vinci surgical system.

Case: We present a case of a 40 year old, Asian female, Gravida 2- Para 1-0-1-1 with irregular, heavy menstrual cycle, abnormal uterine bleeding due to uterine leiomyoma (AUB-L) who underwent Da Vinci Natural Orifice Transluminal Endoscopic Surgery (NOTES), total Laparoscopic hysterectomy (TLH), bilateral salpingectomy (BS), Lysis of adhesions (LOA), and cystoscopy. The patient had uncomplicated recovery and postoperative care and was discharged on postoperative day zero.

Conclusion: Robotic NOTES Total laparoscopic hysterectomy with bilateral salpingectomy is feasible and safe in gynecology patient. This approach has the potential for a less morbid and scarless outcome.

Keywords: da vinci; minimally invasive surgery, natural orifice transluminal endoscopic surgery, robotic NOTES, robotic natural orifice transluminal surgery, single port laparoscopy

Pelvic ultrasound showed enlarged leiomyomatous uterus with multiple uterine fibroids, the largest being 4cm.

Patient underwent Da Vinci Natural Orifice Transluminal Endoscopic Surgery (NOTES), total Laparoscopic hysterectomy (TLH), bilateral salpingectomy (BS), Lysis of adhesions (LOA), and cystoscopy (Figures 1–3).

Figure 1 Performing hysterectomy, Arm 2: fenestrated bipolar grasper, Arm 3: camera, Arm 4: monopolar curved scissors.
Robotic natural orifice transluminal endoscopic surgery (R-NOTES) in gynecologic surgeries, a case report and review of literature

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Figure 2 Closed vaginal cuff with V-loc sutures in situ.

Figure 3 Gross hysterectomy specimen.

GelPOINT mini was placed in the vagina and the Da Vinci XI was docked as following arrangement (Figure 1) (Figure 4):

1. Regular robotic instrument and NOT single-site instruments were used.
2. Arm 1: Not Used
3. Arm 2: fenestrated bipolar grasper
4. Arm 3: camera: 10mm, 30 degree, Bariatric length camera
5. Arm 4: monopolar curved scissors
6. 5 mm AirSeal placed and used as accessory port, suction was placed through this port
7. The robot was docked in “Thoracic Setting”
8. The patient had uncomplicated recovery and postoperative care and was discharged on postoperative day zero.

Discussions

Natural Orifice Transluminal Endoscopic Surgery (NOTES) is a technique that uses a natural orifice such as the mouth, anus or vagina in order to access the abdominal cavity. It was first performed by Rao and Reddy in 2006 for an appendectomy and since then it has been implemented in other surgeries such as gastric and vaginal. Since natural orifices are used, less scarring has been documented as well as less post-operative pain.1,3 The use of robotic assistance, such as the Da Vinci machine can aid in dexterity and precision of the surgical process.5

Although NOTES has strengths it does have drawbacks. Thus far, the safest NOTES route is transvaginally due to enteral closure.1 A draw back to this is that it would only benefit female patients. Furthermore, as this technique is new, it is reliant on advances in medical equipment to make this technique easier and more feasible. As there is only one access port, instruments must be positioned properly and multi-tasking can be difficult.5

Conclusion

Robotic NOTES Total laparoscopic hysterectomy with bilateral salpingectomy is feasible and safe in gynecology patient. This approach has the potential for a less morbid and scarless outcome. Further development of robots adaptive to NOTES would boost efforts toward clinical NOTES applications.

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Conflicts of interest

Other authors did not report any potential conflicts of interests.

References

