

V-NOTES - is this the future of gynaecological surgery? A literature review

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Introduction

Vaginal natural orifice transluminal endoscopic surgery (V-NOTES) is a new form of minimal access surgery that has been pioneered over the past decade. It is an endoscopic technique where entry occurs through the vagina via the pouch of douglas (Fig 1). V-NOTES adds the advantage of endoscopic increased visualisation and access to the adnexa, when compared to conventional vaginal surgery. Driven by the benefits of better cosmesis, projected quicker recovery times and reduced morbidity, V-NOTES is becoming increasingly popular. The aim of this study is to collect evidence regarding the safety and scope of V-NOTES procedures.

Methods

The study was a narrative literature review.. The search was carried out using the PubMed database with the following keywords: "natural orifice transluminal endoscopic surgery", "NOTES" , "vaginal natural orifice" and "natural orifice". We included studies written in English, where V-NOTES had been performed specifically for gynaecological surgery

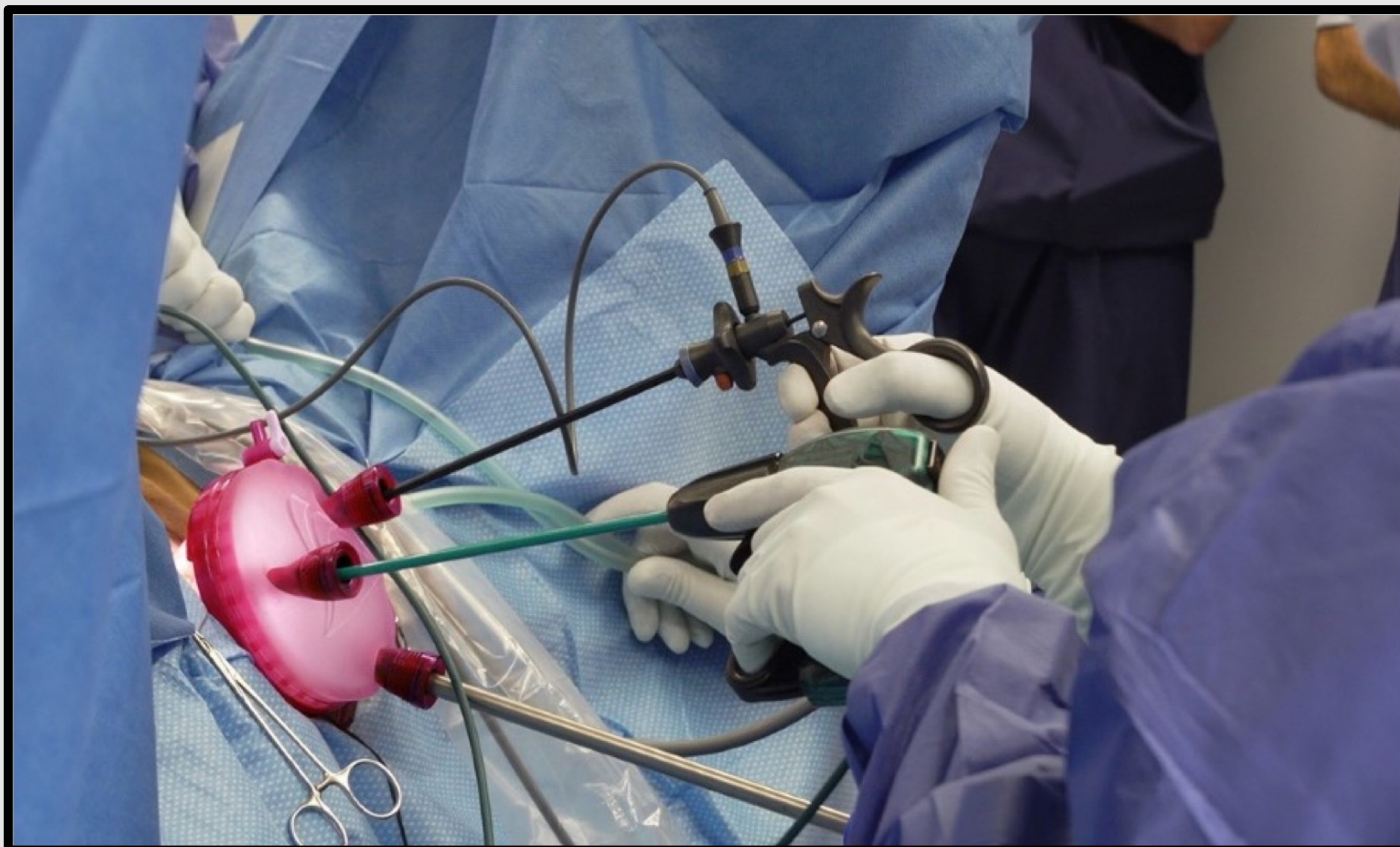


Figure 1. Picture showing the set up of a V-NOTES surgery using the GelPOINT Access Platform

Technique in brief:

vNOTES procedures are typically performed under general anaesthesia with the patient placed in Trendelenberg position. The vaginal mucosa is initially circumscribed around the cervix and mobilised from the uterus – similar to the first steps of a vaginal hysterectomy. An Alexis Retractor (Applied Medical, UK Ltd) is introduced behind the colpotomy incision and pneumoperitoneum then created with an insufflation pressure of 10mm Hg, allowing good visual and operative access. Only a posterior colpotomy is required for adnexectomy.

Su and colleagues from Taiwan first described the concept of attaching a surgical glove onto the rim of an Alexis Retractor and incising the finger ends to admit a standard 10mm trocar, (which is used for CO2 insufflation and laparoscope insertion) and various endoscopic instruments (*figure 2*). While such home-made devices can be effective and cost saving, the current practice is to use specially designed airtight access platforms such as GelPOINT (Applied Medical, UK Ltd) (*figure 3*) in order to provide a seal around the vaginal cuff to maintain insufflation pressure and allow introduction of instruments. The access platform is made from a soft gel which allows 2, 3 and 4 port configurations. Typically, the port for the laparoscope is placed at the 6 o'clock position for optimal views.

Following surgery, specimens are retrieved through the vagina and the colpotomy incision closed with absorbable sutures. Compared to traditional laparoscopy, the low-pressure maintenance pneumoperitoneum used in vNOTES (6–10 mmHg vs 12–16 mmHg respectively) means that less anaesthetic ventilation is required, together with a lower risk of insufflation-induced bradycardia and carbon dioxide resorption³. The lower insufflation pressure and less invasive approach have resulted in the reporting of less severe postoperative Visual Analogue pain scores, and most patients are comfortable with paracetamol and non-steroidal anti-inflammatory drugs.



Figure 2. Picture showing the set up of a V-NOTES surgery using the glove technique



Figure 3. Picture showing the components of the GelPOINT Access Platform including the Alexis retractor, trocars, ports

Findings (1)

A total of 16 studies with 1601 cases were identified. The studies are concentrated within a few centres who are establishing the technique. Although the majority of data revolved around hysterectomy outcomes, v-NOTES is being increasingly utilised for adnexal surgery including treatment of ectopic pregnancy, salpingo-oophorectomies and cystectomies amongst others. V-NOTES was shown to have comparable safety to conventional laparoscopic techniques in a number of randomised control trials whilst having the benefit of avoiding abdominal scarring, incisional hernia and complications related to port site injury. Operating time was also equivalent to conventional laparoscopy despite the technique being novel to the surgeons involved. Regular laparoscopic instruments can be used alongside 1 specialised port (*figure 1*, *figure 2*) meaning costs parallel those of laparoscopy. Length of stay and post-operative pain score appears to be reduced for V-NOTES when compared to other techniques.

Findings (2)

Training and learning curve: Despite the clear advantages reported, there is little data available to assess the learning curve for vNOTES skill acquisition. Anecdotally, once colpotomy is achieved, the technique represents a natural endoscopic extension of surgical steps of a vaginal hysterectomy. For an experienced surgeon adept in both laparoscopy and vaginal surgery, it has been suggested that 20 cases comprised the initial learning curve. The current shortage of experienced operators providing exposure to vNOTES training may deter interested gynaecologists from applying this technique in daily practice.

Cost-effectiveness: Two studies discussed financial costs comparing vNOTES with LAVH and TLH. Wang et al reported that the mean hospital charge for a vNOTES case was approximately 5000 New Taiwan Dollars (£130) more than LAVH and this was primarily driven by the price of disposable Alexis Retractors and energy devices, while Baekelandt et al estimate that vNOTES and TLH incurred similar cost variables. That theatre operating time was significantly shorter with vNOTES and that most patients undergoing the procedure were discharged 0.5 days earlier and needed less postoperative analgesia were often not factored into the cost calculations. Little is also known about the relative loss of income and productivity in women undergoing LAVH and TLH when compared to vNOTES as the latter group is likely to return to daily activity more rapidly.

Conclusion

V-NOTES appears to be a safe, cost effective technique with a short learning curve for most laparoscopic surgeons and vaginal surgeons. It has the opportunity to provide an alternative approach for adnexal surgery that provides better cosmesis and patient satisfaction post-operatively.