



# Real Time Ultrasound Guided Safe Insertion of Veress Needle for Insufflation during Laparoscopy in a Morbidly Obese Woman: A Case Report

Chidinma Magnus Nwogu <sup>a</sup>, Ayodeji Kayode Adefemi <sup>b\*</sup>,  
Aloy Okechukwu Ugwu <sup>c</sup> and Adebayo Williams Awoniyi <sup>d</sup>

<sup>a</sup> Kingswill Advanced Specialist Hospital, Lagos, Nigeria.

<sup>b</sup> Lagos State University Teaching Hospital, Ikeja, Nigeria.

<sup>c</sup> 68 Nigerian Army Reference Hospital, Yaba, Lagos, Nigeria.

<sup>d</sup> Lagos University Teaching Hospital, Idi-Araba, Nigeria.

## **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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**Case Report**

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## **ABSTRACT**

Induction of pneumoperitoneum during laparoscopy is considered one of the major steps in minimally invasive surgery. Traditionally many surgeons use the blind technique for insertion of Veress needle which has been reported to increase the risk of complications especially in obese patients. In morbidly obese individuals, evidence has shown that this blind entry into the peritoneal cavity for pneumo-insufflation can be difficult. This is because there is an increased risk of subcutaneous layer insufflation causing subcutaneous emphysema in the very obese individuals,

\*Corresponding author: E-mail: [adefemiyodejikayode@gmail.com](mailto:adefemiyodejikayode@gmail.com);

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and increased risk of visceral and vascular injuries occasioned by overshooting of the Veress needle way too far beyond the desired distance. We present a case report of a very obese patient with previous failed attempt at laparoscopy in which accurate measurement using ultrasound guidance necessitated safe Veress needle entry into the peritoneum and subsequent successful laparoscopy.

In conclusion, this case report provides a comprehensive challenges and innovative solutions in performing laparoscopic procedures on morbidly obese patients. It addresses a growing clinical concern with detailed descriptions on the use of ultrasound-guided Veress needle insertion and the management of subcutaneous emphysema, offering practical recommendations that enhance patient safety. By highlighting these advanced methods and emphasizing the importance of patient-specific adaptations, the manuscript contributes valuable insights and practical knowledge that can improve surgical outcomes and inform future research in gynaecological and bariatric surgery in developing countries.

*Keywords: Laparoscopy; pneumoperitoneum; ultrasound-guided; morbidly obese.*

## 1. INTRODUCTION

Abdominal entry prior for insufflations for laparoscopic procedures is associated with the risks of vascular injuries, visceral organ injuries, bowel perforation, subcutaneous emphysema and peritoneal adhesions [1].

Conventionally, two common methods of establishing pneumoperitoneum and gaining access to the abdomen during laparoscopy have been described. These techniques are closed entry which could be via the use of Veress needle or direct entry using the primary trocar and open entry popularly known as Hasson entry [2].

Modifications in the Veress needle and trocar designs, entry techniques and entry sites are all advancements geared towards preventing the difficulties encountered during entry especially the very obese and people of very thin habitus so as to minimize the injuries to intraabdominal organs [3].

The proportion of obese individuals is rapidly increasing worldwide and considering the difficulties encountered during abdominal entry during laparoscopy in such patients, and subsequent injuries/complications; meticulous planning is therefore imperative to avert the complications that may arise [4,5]. Historically laparoscopic surgery has been viewed to be relatively contraindicated in obese patients [5,6]. However, recent evidence suggests that laparoscopy can be safely done in any individual irrespective of body mass index [7].

## 2. CASE REPORT

A 31-year-old nulliparous lady with infertility and background polycystic ovarian syndrome who had a diagnostic laparoscopy and dye test. Weight was 105kg and her BMI was 42.6kg/m<sup>2</sup>. Her umbilicus was caudally displaced below the level of an imaginary horizontal line joining both anterior superior iliac spines. Entry point was through the umbilicus, which was manually mobilized cephalad as much to midpoint between the xiphoid process and the pubis symphysis. She had 3 failed attempts at entry in the usual manner of entry with subcutaneous emphysema noticed around the mons pubis and upper vulval region after the third attempt. Two 14G intravenous cannulas were inserted around the mons pubis, releasing the subcutaneous emphysema within 60 seconds of a hiss sound. A transvaginal ultrasound scan probe was placed at the same site of previous entry and the thickness of the fat beneath was better appreciated and so was the distance to the deep viscera. An image of the Veress needle into the peritoneum was seen in addition to the regular signs of correct entry before insufflation was commenced. Adequate insulation was thereafter achieved, and trocars inserted, and a diagnostic laparoscopy and dye test was successfully achieved.

## 3. DISCUSSION

This case report describes the difficulties encountered in performing a diagnostic laparoscopy and dye test for the evaluation of infertility in a morbidly obese nullipara with previous several failed attempts at the procedure. Different techniques have been used during entry into the abdominal cavity to avoid

complications ranging from the use of the umbilicus for entry as an alternative entry site using the well described Palmer's point. This has been a rescue in the presence of a median sub umbilical scar, presence of known or suspected periumbilical adhesion from previous surgeries, history or presence of umbilical hernia, significant pelvic masses and several or three failed entries at the umbilicus [8].

Various laparoscopic complications associated with obesity include failed entry as happened severally in her case, overshooting of Veress needle or trocar thereby leading to vascular and visceral injury, difficulty penetrating thick panniculus and subsequent subcutaneous emphysema [9]. Several modifications are being made to avert these complications such as ultrasound guided Veress needle entry, use of longer Veress needle and variations in of inclination from 45 to 90 degrees [10].

With increasing BMI, the pannus moves caudally along with the umbilicus which could no longer be used as the landmark for the midpoint between the xiphoid and the pubis symphysis [7].

Hence, any simple, quick, non-invasive method to avoid these set-backs with extremes of body habitus will be a gain for safe pneumoperitoneal insufflation [8].

The use of hand-held Doppler and colour flow duplex may help with vascular marking and reduce risk of vascular injuries [8]. Pre-operative evaluation with abdominal and pelvic palpation along with pelvic ultrasound may help identify presence of unusual masses at risk of injury during pneumoperitoneal needle placement.

And ultrasound guided needle insertion with preferably a high frequency ultrasound probe such a transvaginal probe placed abdominally with the Veress needle beside it at the proposed entry site can clearly delineate the layers of the anterior abdominal wall and any viscera that may closely related to it peritoneal y. This can prove to be extremely helpful is ensuring certainty of peritoneal entry with Veress needle visualization passing through all the abdominal wall layers and seen beyond the peritoneum with less anxiety about injury especially with distorted anatomy of the very thin and the very obese.

Laparoscopy is generally a safe procedure however there are recognizable known complications associated with the process of

creating a pneumoperitoneum such as visceral and vascular injuries, gas embolism and pneumothorax. subcutaneous emphysema and failed entry [8].

#### **4. CONCLUSION**

This case report provides a comprehensive challenges and innovative solutions in performing laparoscopic procedures on morbidly obese patients. It addresses a growing clinical concern with detailed descriptions on the use of ultrasound-guided Veress needle insertion and the management of subcutaneous emphysema, offering practical recommendations that enhance patient safety. By highlighting these advanced methods and emphasizing the importance of patient-specific adaptations, the manuscript contributes valuable insights and practical knowledge that can improve surgical outcomes and inform future research in gynaecological and bariatric surgery in developing countries.

#### **DISCLAIMER (ARTIFICIAL INTELLIGENCE)**

We hereby declare that no generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during writing or editing of manuscripts.

#### **CONSENT**

The authors certify that they have obtained all appropriate patient consent forms for the data to be published.

#### **ETHICAL APPROVAL**

This study was approved by the research committee of the 68 Nigerian Army Reference Hospital Yaba. Reference: 68 NARHY 172GY.

#### **GUARANTOR**

The corresponding author will act as the guarantor for this manuscript.

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#### **COMPETING INTERESTS**

Authors have declared that no competing interests exist.

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