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GYNAE SPECTRUM

Dear Doctor,
Greetings from Micro Labs. We are happy to bring you “Gynae Spectrum”, which contains latest and interesting news in the field of Obstetrics and Gynecology.

This issue contains:

1. **A study to evaluate a new diagnostic tool for cervical intraepithelial neoplasia using hyperspectral imaging.**
2. **A study to investigate pre-pregnancy lifestyle intervention to reduce recurrence of gestational diabetes mellitus.**
3. **A study on assessing the vascular and nerve-sparing bowel resection for deep endometriosis**
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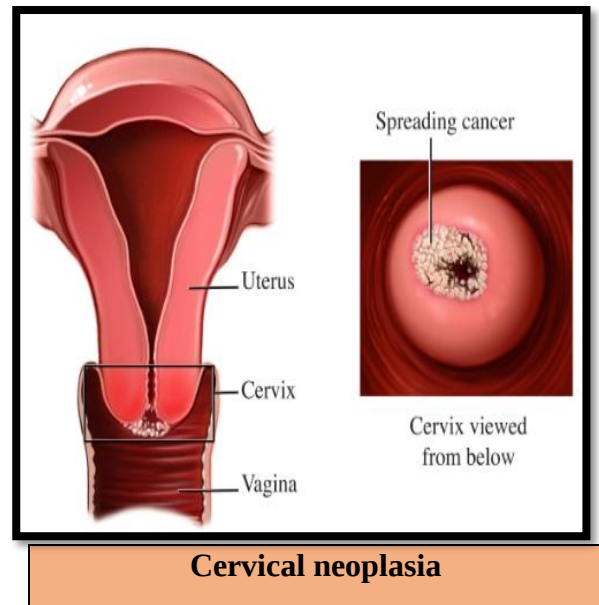
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Looking forward to your valuable feedback.
Best Regards,
Medical Team, Micro Labs Limited

A study to evaluate a new diagnostic tool for cervical intraepithelial neoplasia using hyperspectral imaging.

Introduction –

Human papillomavirus (HPV) infection is a sexually transmitted disease which affects the cervix and is a significant risk factor for the development of cervical intraepithelial neoplasia. Worldwide HPV 16 accounts for 55 to 60% cases of cervical cancer¹. Cervical intraepithelial neoplasia (CIN) is a spectrum of serious precancerous lesions that is divided into three grades which includes CIN1 represents mild dysplastic lesions, CIN2 and CIN3 indicate moderate to severe dysplasia. Human papillomavirus (HPV) testing is sometimes combined with pap smear cytology of the cervix in the screening process for cervical cancer². The objective of this study is to assess the suitability of the TIVITA® Tissue system for in vivo tissue differentiation of CIN.



Methods –

In this prospective, monocentric study, 41 patients with histologically confirmed CIN were included. The patients' ages ranged from 28 to 71. Colposcopy-directed biopsy performed before HSI measurement and loop electric excision of the transformation zone performed after HSI measurement were used to identify CIN. The TIVITA® Tissue System was used for portio hyperspectral imaging. Hyperspectral imaging (HSI) and high resolution colposcopic assessment by visual inspection with acetic acid (VIA) images were compared in order to analyse the data. The accuracy of CIN identification and distinction in comparison to intra-individual benign regions of the portio was the primary end point.

Results –

Results showed that CIN patients were classified on different grades as (n = 1 patient with CIN 1, n = 8 patients with CIN 2, n = 32 patients with CIN 3 (78.1%). Between CIN lesions and healthy portio tissue, there are major and statistically significant differences, according to a thorough examination of the complete wavelength spectrum from 500 to 990 nm. The unique wavelength region of 555-585 nm is highlighted in the HSI spectra for identifying CIN lesions from healthy cervical tissue (Figure.1). The spectral properties within this range can serve as reliable indicators of abnormal tissue because the absorption of this wavelength region showed statistically significant changes. In addition, a clear discrepancy was seen at 575 nm. Indicating

that it might be used as a focused marker for the detection and diagnosis of CIN lesions during colposcopy, this particular wavelength demonstrated the highest discriminatory power.

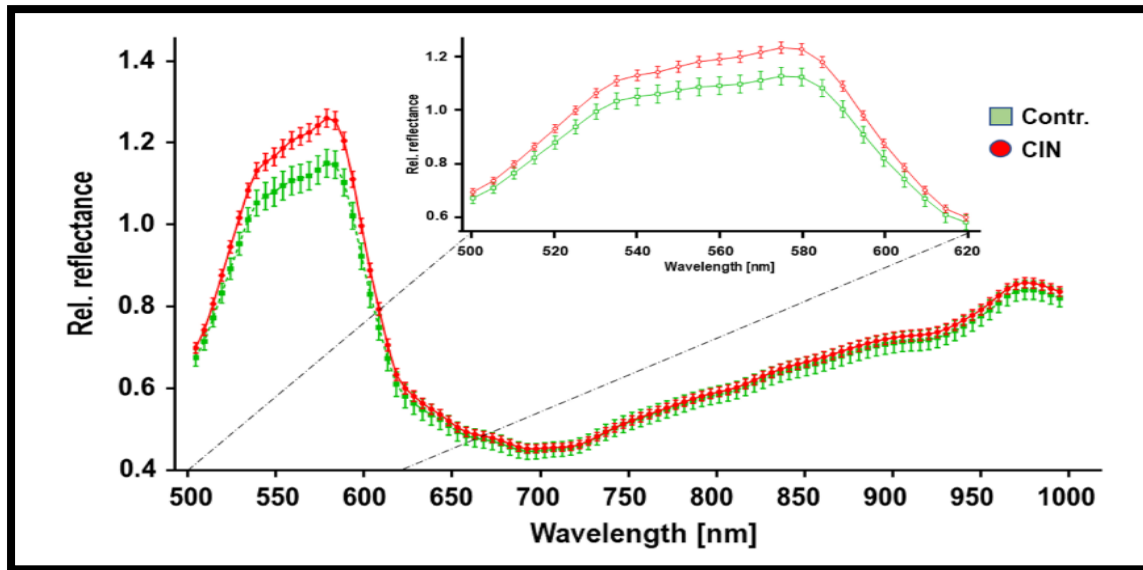


Fig.1 - HSI spectra of CIN lesions vs control

Discussion –

Colposcopy is essential for assessing cervical abnormalities, including cervical cancer screening, diagnosis, and treatment options. Colposcopy, in conjunction with VIA and iodine staining, enables the detection of small changes and abnormalities by enabling visualization of the cervix². HSI is a quick, non-invasive method that can be used on solid tumors. In contrast to conventional optical imaging techniques, which could only collect a few number of spectral bands³, HSI is capable of simultaneously and non-invasively capturing images under many spectral bands (e.g., visible, infrared, and ultraviolet band)³. The main objective of the current experiment was to determine whether it would be feasible to differentiate CIN lesions using the TIVITA Tissue System. This system's limited tissue-camera distance of 50 cm, however, poses an important limitation that prevents routine colposcopy surgeries from using it². TIVITA, which produces HS pictures with a spectral resolution of 5 nm and a spectral range of 500–1000 nm, is frequently used in biological tissue detection systems to produce a 640×480×100 data cube with an acquisition time of roughly 6-7 s⁴.

Conclusion –

By connecting each pixel to high-dimensional spectra, HSI improves tissue distinction and collects morphological and biochemical data about the tissue under observation. A contact- and marker-free examiner independent method for CIN diagnosis may be provided by HSI systems.

Hyperspectral imaging spectra highlights specific wavelength range of 555–585 nm to differentiate between cervical intraepithelial neoplasia lesions and healthy cervical

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A study to investigate pre-pregnancy lifestyle intervention to reduce recurrence of gestational diabetes mellitus.

Introduction –

Gestational diabetes mellitus (GDM) is defined as the abnormal glucose tolerance with onset or first recognition during pregnancy. GDM has been linked to obstetric and neonatal problems, mainly those related to increased infant birthweight, and is becoming increasingly recognised as a risk factor for future cardiometabolic disease in both the mother and the child¹. Numerous observational studies have revealed that physical activity and preconception weight loss may reduce the possibility of developing GDM². Hence this study aimed to determine the effects of a prepregnancy weight loss intervention on gestational diabetes mellitus recurrence in women with overweight/obesity and previous gestational diabetes mellitus.

Methods –

To compare the prepregnancy lifestyle intervention, a two-site, randomised controlled experiment was conducted. There were 25 women in the control group and a total of 63 pregnant women with gestational diabetes mellitus in the intervention group. Women who were overweight or obese and had gestational diabetes mellitus in the past were randomly assigned to receive either a 16-week lifestyle intervention before becoming pregnant or educational control. Preventing gestational diabetes mellitus was the main result. Secondary outcome was prepregnancy lifestyle intervention. Assessments were done at the beginning, at 16 weeks, at 26 weeks, and at 6 weeks following delivery and brief quarterly visits occurred until conception time.

Results –

At the end of the 16-week period, the lifestyle intervention group had lost an average of 4.8 kg (5.7% of their starting weight), compared to the control group's loss of 0.7 kg (0.7% of their starting weight). After 16 weeks, more intervention participants than control individuals lost at least 5% of their body weight. At the final visit, the percentages of intervention and control participants who dropped BMI categories were 26.5% (9/34) and 10.0% (1/23), respectively. The intervention group had a recurrence rate of gestational diabetes mellitus of 57.9% [23/38] while the control group had a recurrence rate of 44.0% [11/25] (Figure 1). Increasing weight loss between study enrolment and last weight recorded before pregnancy predicted 21% lower odds of GDM recurrence, with a reduction in risk of 24% for every kg lost prior to pregnancy. An 82% decrease in the gestational diabetes mellitus recurrence was seen with a 5% weight loss prior to conception.

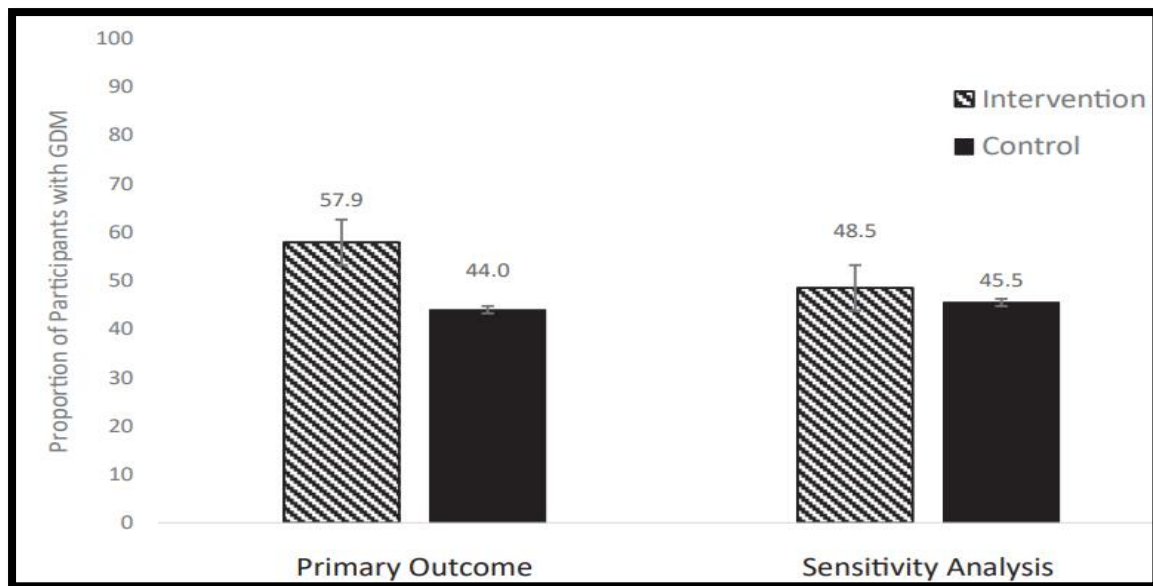


Fig.1 - Proportions of recurrent GDM in prepregnancy in intervention and control group

Discussion –

Over the course of four months prior to becoming pregnant, women in the intervention arm dropped 5.7% of their original body weight, and 50% of them lost a clinically relevant 5%. Weight loss before conception decreased the risk of GDM recurrence by 21%, while weight loss of less than 5% of one's original body weight decreased the risk of GDM recurrence by 82%². According to the study by Sorbye et al., inter-pregnancy weight loss reduced risk of GDM recurrence in overweight/obese women. Weight gain between pregnancies was the main factor for increased recurrence risk for GDM in both normal and overweight/obese women. Hence stating the importance of weight management in women with a history of GDM³. Wang et al., stated that advanced maternal age, pre-gestational obesity, insulin required in the first pregnancy, family history of diabetes in first-degree relatives, weight gain between pregnancies and postprandial glucose value at the oral glucose tolerance test (OGTT) were also strongly correlated with GDM recurrence⁴.

Conclusion –

The risk of GDM recurrence was reduced by weight decrease prior to pregnancy. Although a lifestyle intervention led to weight loss prior to conception, it had no impact on the prevalence of gestational diabetes.

Increasing weight loss prepregnancy reduced the risk of gestational diabetes mellitus recurrence

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A study on assessing the vascular and nerve-sparing bowel resection for deep endometriosis

Introduction –

Deep endometriosis (DE), is the most severe form defined as endometrial glands and stroma infiltrating the peritoneum by at least 5 mm ¹. A neuro-inflammatory illness known as endometriosis that causes debilitating chronic pelvic pain is thought to affect 6% to 10% of women of reproductive age. 50% of women seeking treatment for infertility had endometriosis lesions discovered, even if they are asymptomatic². Bowel endometriosis has been estimated to affect between 5% and 12% of patients. 90% of all intestinal lesions involve the rectum and sigmoid¹. Hence the study aimed to determine the complication rates and functional outcomes of a nerve- and vascular-sparing bowel resection technique for DE.

Methods –

This is a single-center, observational, retrospective study involving symptomatic women who underwent laparoscopic removal of a DE along with segmental bowel resection that preserved the inferior mesenteric artery (IMA) and used a nerve-sparing method. This study comprised 61 women in total. 39 (67.2%) women in total had never undergone surgery for endometriosis. Furthermore, at least three months before to surgery, 44 patients (72.1%) had received prior hormone therapy. Evaluation of surgical outcomes was the study's main result. In order to emphasise potential improvement following the intervention, secondary end points were pain symptoms both at baseline and at the 6-month follow-up, as well as functional outcomes linked to pelvic organs (bowel, urine, and sexual function), assessed using validated questionnaires.

Results –

At baseline, VAS pain score were high for dysmenorrhea and dyschezia, whereas pain due to dysuria was low. QoL was scarce, expressed by a mean gastro-intestinal quality of life index (GIQLI) of 57.6 ± 22.1 . However, there was an indication of sexual dysfunction, despite the fact that urinary function was generally good, with a median bristol female lower urinary tract symptoms (BFLUTS) score of 9. Intestinal nodules of 43 single (73.8%) were compared with 16 multiple (26.2%). Totally intracorporeal anastomosis (TICA) was done in 20 (32.8%) female patients, while bowel anastomosis was done by using double stapling technique in 47 women (Figure.1). Protective ileostomy was needed in 19 (31.1%) cases. While only 3 patients

(4.9%) required anterior parametrectomy, 48 patients (78.7%) required posterior parametrectomy, and 23 patients (37.7%) required total hysterectomy. Very few intraoperative problems occurred (n=2; 3.3%). Pain symptoms were significantly reduced, while significant improvement was observed on the constipation index during the 6-month follow-up evaluations.



Fig.1 – Colotomy performed cranially and proximally to the endometriotic lesion

Discussion –

Due to preservation of the main vascular arch of the rectum and the performance of a nerve-sparing dissection of the mesorectal and parametrial planes there was low rate of intraoperative and postoperative complications. Bladder voiding deficit was the most frequent postoperative consequence (8.6%), and it was cured in all five patients after 45 days with intermittent self-catheterization¹. A study by Scioscia et al., showed that laparoscopic rectosigmoid excision for endometriosis is possible with IMA-sparing surgery without any increase in postoperative complication rate³.

Conclusion –

Deep endometriosis patients who underwent surgery using vascular and nerve-sparing segmental bowel resection technique had a low rate of intraoperative and postoperative complications and improved gastrointestinal function.

Vascular and nerve-sparing segmental bowel resection technique was associated with lower operative complications

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A Case report to evaluate mid-trimester spontaneous rupture of a bicornuate uterus

Introduction –

Partial union of the Mullerian ducts produces a bicornuate uterus (BU), resulting in a heart-shaped uterus instead of a pear shape. During morphogenesis, a number of genes, including Pax, Lim1, Emx2, Wnt4, and Wnt9b, contributed to form Mullerian ducts¹. Significant reproductive difficulties, such as mid-trimester miscarriages, preterm labour and delivery, malpresentation, and antepartum and postpartum haemorrhage, are linked to bicornuate uterus. However, in primigravida women, BU may be the only risk factor for uterine rupture². This report aimed to present and manage a primigravida woman who experienced spontaneous rupture of a left-sided horn of BU during the second trimester.

Case presentation –

A 21 years old healthy primigravida female was at 19 weeks and 5 days of gestation. It was an unplanned pregnancy and she had irregular antenatal care visits. The patient complained of severe abdominal pain that lasted for two hours and was accompanied by progressive abdominal distension, dizziness, and shoulder-tip pain. There was no history of vaginal bleeding. When the patient arrived at the emergency room, blood pressure was 70/40 mmHg, heart rate was 130 beats / minute, and rate of respiration was 24 / minute. An examination of the abdomen revealed a swollen stomach that reached the xiphoid process and widespread abdominal pain. An abdominal ultrasound revealed clots and fluid filling the cavity, as well as a non-viable foetus with foetal biometry consistent with 20 weeks of gestation. It was clinically suspected as ruptured uterus. An emergency laparotomy was decided upon after starting immediate resuscitation. In addition to a non-viable foetus in the abdominal cavity and a bicornuate uterus with a torn left horn at the fundus(Figure.1), intraoperative examinations revealed a huge hemoperitoneum of around two litres of blood and blood clots. There was a 300 g foetus within. At the point where the ruptured left horn meets the right horn, it was removed. The defect left from the excision was then stitched up in 2 layers using delayed absorbable sutures, and a drain was placed within the abdomen. Four units of packed red blood cells and four units of fresh frozen plasma were transfused into the patient, who was then transferred for a night to the intensive care unit (ICU). On the fourth post-

operative day, the patient was stable and discharged. Follow-up showed an easy recovery.

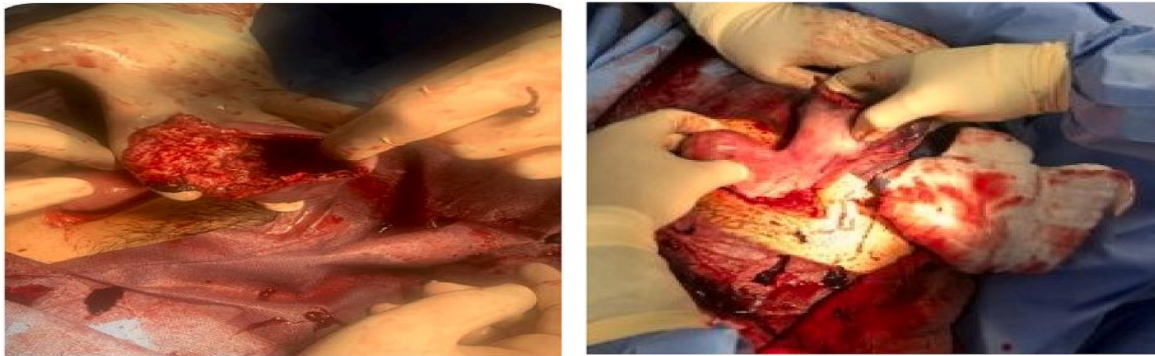


Fig.1- Left horn ruptured at the fundus

Discussion –

Even in the absence of a previous uterine scar, a bicornuate uterus is an uncommon abnormality that is thought to increase the chance of uterine rupture. The diagnosis of BU is typically made during pregnancy or delivery when difficulties emerge, or after abdominal surgery. BU are typically asymptomatic. In this case report, ultrasonography found a non-viable foetus in the abdominal cavity with foetal biometry and fluid filling the cavity with clots. A second laparotomy was performed, and the ruptured left horn and foetus were removed². A 32-year-old woman who had a bicornis bicollis uterus in one of the uterine horns later gave birth to a live male neonate at term through spontaneous vaginal delivery (SVD) without any complications. Ultrasonography should be used as the baseline for detecting uterine abnormalities such as bicornuate uterus³. An 18-week pregnant woman, complained of abdominal pain caused due to uterine rupture. A bicornuate uterus with uterine rupture and a nonviable foetus was found after laparotomy. To stop bleeding, a supra-vaginal hysterectomy was performed on the left uterine horn⁴. Hence stating that bicornuate uterus can lead to complication during pregnancy.

Conclusion –

Hence the case concludes that various obstetric issues are linked to bicornuate uterus at different gestational ages. A ruptured uterus in women and a picture of hypovolemia in pregnant women in the middle of their third trimester are two differential diagnoses that must be taken into account when there is acute abdominal discomfort.

Bicornuate uterus is risk factor for uterine rupture and is associated with the reproductive complications

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