



Womb & Wellness

The POGS Chronicle ♦ Issue 3, June 2025



स्त्रियाः हिताय प्रयत्नान्
Striving For The Betterment Of Woman



POGS App

On the auspicious occasion of Gudi Padwa, we are thrilled to announce the launch of the brand-new POGS App, set to debut at our 40th POGS Installation CME!

For the very first time, POGS is bringing you a state-of-the-art mobile application available on both Android and iOS. This app is designed to centralize all POGS-related information, making it easier than ever to stay connected and engaged.

Overview:

- Seamless New Member Registration: Join our community with just a few taps.
- Easy Conference Registration: Book your spots for upcoming events right at your fingertips.
- Monthly Quiz: Test your knowledge and win exciting prizes!
- Digital Library: Access monthly newsletters, a video library, and recordings of past conference lectures

Get ready to experience the convenience and innovation of the POGS App. Stay tuned and be prepared to take your POGS experience to the next level!

Dr Manish Machave

President POGS 2025-26

Dr Nilesh Balkawade

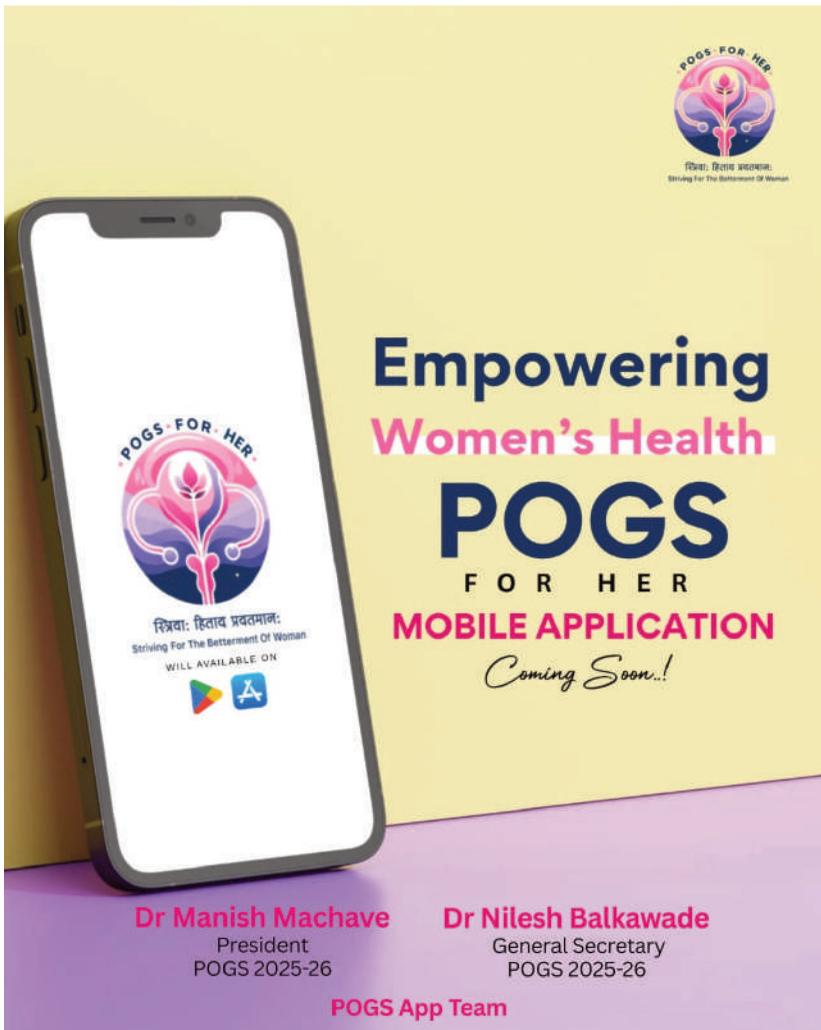
General Secretary

POGS 2025-26

POGS App Team

Dr Mahima Lalwani

Dr Mrinmayee Dharmadhikari



The graphic features a smartphone displaying the POGS app interface. The app screen shows the POGS logo, the motto 'नित्रया: हिताय प्रयतमानः' (Striving For The Betterment Of Woman), and the text 'WILL AVAILABLE ON' with Google Play and App Store icons. To the right of the phone, the text reads 'Empowering Women's Health POGS FOR HER MOBILE APPLICATION Coming Soon..!'. At the bottom, the names and titles of Dr Manish Machave (President POGS 2025-26) and Dr Nilesh Balkawade (General Secretary POGS 2025-26) are listed, along with the 'POGS App Team'.



Office Address: No. 302-303, Dr. Nitu Mandke IMA House, 992, Shukrawar Peth, Tilak Road, Pune - 411 002. Maharashtra.

Contact: 020 2449 1000 / 020 2951 0120, 87665 09985.

E-mail: pogsoffice@gmail.com

Website: www.pogs.in

Follow us on Facebook - **Pogs For All**
Instagram - pogs.forall

Presidential Address

Dear esteemed member of POGS,
Greetings from the team,

'And there is no new thing under the sun' (Ecclesiastes i:8). Nowhere is this more true than in the field of endoscopy. The wish to peer into the body is as old as recorded history. The earliest descriptions of endoscopic examinations were from the Kos school led by Hippocrates in Greece (460-375 BC) . He was the first to make reference to a rectal speculum. At the same time the first simple speculum for gynecological endoscopy had emerged A three-bladed vaginal speculum was found in Pompeii's ruins (70 AD) , that can be seen in the Institute Rizzoli in Bologna; this instrument was similar to the modern vaginal speculum.

John D. Fisher (Boston 1798-1850) described an endoscope to inspect the vagina, and he modified it to examine the bladder and urethra as well.

Pantaleoni (1869) adapted Desormeaux' telescope for hysteroscopy . He was able to identify an intrauterine polyp in a 60-year-old woman with postmenopausal bleeding and performed the first intrauterine surgery when he cauterized the polyp with silver nitrate.

Raoul Palmer (Paris In 1944) first time performed gynecological laparoscopy. He placed the patients in the Trendelenburg position so air could fill the pelvis.He also stressed the importance of continuous intra-abdominal pressure monitoring during a laparoscopic procedure. During the 1960s, Kurt Semm, a German gynecologist, created the automatic insufflators His experience with this new device was published in 1966. He played a great role in the development of laparoscopy. He called his procedure "Pelviscopy." He performed an appendectomy during a gynecological procedure and opened a large door for a new surgery. H.M. Hasson, a gynecologist from the Grant Hospital of Chicago, Augustana Hospital and Columbus-Cuneo Medical Center, developed a technique performing laparoscopy through a miniature laparotomy incision.In 1981, rules and requirements to perform laparoscopy were adopted by many hospitals and surgical societies.

Gynaecological endoscopy has developed and blossomed into a fine art where science and skill do the ballet.

We are delighted to bring to you various topics in endoscopy that shall surely benefit not only the novices but also put in a trick or tip for the experienced surgeons.

Do take out time and post us a feedback.

Happy reading.

Looking forward to see you all soon.

Till Then,

SAYONARA,NAMASKAR...



Dr Manish Machave
President, POGS

Dr Manish Machave



Dr Nilesh Balkawade
Secretary, POGS

Secretary's Address

"Success is not just about making progress; it's about inspiring others to rise with you."

Dear Esteemed Members,

June has been a month of meaningful engagement, academic brilliance, and impactful outreach for the Pune Obstetrics and Gynaecological Society (POGS). I take immense pleasure in sharing the highlights of this vibrant month with all of you.

Our Medicolegal Masterclass, a much-anticipated program, was a resounding success. This initiative by POGS addressed some of the most pressing medico-legal concerns that modern clinicians face, and the overwhelming participation is a testament to its relevance and impact. The Convenors were Dr Meenakshi Deshpande, Dr Madhu Juneja, Dr Charuta Joglekar and Dr Tanuja Joshi

We also had the privilege of hosting the AMOGS CME in collaboration with POGS, which witnessed exceptional attendance. The presence of distinguished speakers like Dr. Vinay Thorat and Dr. Jagdish Hiremath added tremendous value to the sessions, enriching our understanding of current clinical and ethical issues. Dr Kiran Kurtkoti President AMOGS lead from the front to arrange this program

The POGS Round of the FOGSI Dr. Usha Krishna Quiz was conducted successfully, drawing enthusiastic participation from budding postgraduates. The spirit of learning and friendly competition made it a memorable event. Quiz Committee POGS with Dr Kanchan Durugkar, Dr Anjum Shaikh, Dr Arati Yewale and Dr Prajakta Khose under guidance of Dr Amey Chugh, Chairperson quiz Committee, POGS

On May 28, Menstrual Hygiene Day, POGS continued its commitment to public health advocacy by spreading awareness and education around menstrual hygiene — a subject still shrouded in silence but vital to women's health and dignity. Convenor was Dr

Manasi Naralkar under the supervision of Dr Vaishali Biniwale, Chairperson PAC, POGS

Academically, POGS conducted cutting-edge webinars led by Dr. Vaishali Chavan, which were highly appreciated by attendees. We also stand united in supporting Dr. Vaishali Chavan's candidacy for the post of FOGSI Vice President. Her leadership, vision, and commitment make her an ideal choice, and we assure her of our full support.

Another enriching academic event was the CME on Vulvovaginal Infections, where practical insights were shared to help clinicians improve diagnostic accuracy and therapeutic decisions in day-to-day practice. Dr Kalyani Ingale Clinical Secretary was the convener.

In alignment with national goals, POGS celebrated the FOGSI Environment Day with great enthusiasm. Under the leadership of Dr. Tanuja Joshi as the convener, our members participated in a tree plantation drive, reaffirming our pledge toward environmental responsibility.

Looking ahead, we are excited to announce the upcoming POGS-AMOGS Wari on Snehdindi — a unique program that aims to bridge the gaps in doctor-patient relationships. We invite you all to be a part of this inspiring journey that combines tradition, connection, and care. Please connect with Dr Arati Nimkar and Dr Vaishali Biniwale for the same!

Let us continue to stand together — to learn, to serve, and to lead with compassion and courage.

Warm regards,
Dr. Nilesh Balkawade
Gen. Secretary, POGS

Editorial

Warm greetings from the beautiful city of Pune!

This month of June, POGS has taken up the project of bringing the newsletter, “Womb and Wellness” to you that has an optical view inside the womb & the belly of the women.

These are the sophisticated medical & technical advances which have many applications in modern gynaecology and the list is growing every year. The endoscopic surgeries in gynaecology are being increasingly favoured over the open abdominal approach due to superb clear visualization, reduced incidence of adhesions, minimal possibility of trauma, low incidence of complications, rapid recovery, shorter hospital stay making it possible to perform day care procedures, and cosmetically better outcome with least amount of scarring. Endoscopic surgeries have an advantage of faster recovery of the patients & lesser incidence of infections.

The good endoscopic surgeon emerges with excellent operative skills only after a proper training, keen observations, applications of newer techniques in innovative ways. Obviously, the magic wands, (telescopes & related instruments) at the hands of the very well trained & skilled gynecological endoscopic surgeons make it possible for the women to recover from any of the acute or chronically suffering physical health issue remarkably, achieve the dream of conception, get rid of the agonizing symptoms due to prolapsed female reproductive organs.

The team POGS 2025 – 26 is releasing this issue which hold many articles with surgical tips & tricks shared straight from the operation theatres & through the cameras of such giant academicians who are helping the womanhood to bounce back to a beautiful life & bloom with confidence. We wish this issue uplifts your approach towards endoscopic surgeries affirmatively.

Dr Kalyani Ingale,
Clinical Secretary,
POGS 2025 – 26



Dr Kalyani Ingale
Editor

POGS CORE TEAM



Dr Manish Machave
President, POGS



Dr Nilesh Balkawade
Secretary, POGS



Dr Uma Wankhede
President Elect



Vice President
Dr Vaishali Chavan



Ex Vice President
Dr Vaishali Korde Nayak



Clinical Secretary
Dr Kalyani Ingale



Treasurer
Dr Samidha Dalvi



Jt Secretary
Dr Sandhya Meshram



Jt Clinical Secretary
Dr Meghana Argade



Jt Treasurer
Dr Anagha Pai Raiturkar

POGS MANAGING COMMITTEE



Dr Manish Machave
President, POGS



Dr Nilesh Balkawade
Secretary, POGS



Dr Uma Wankhede
President Elect



Vice President
Dr Vaishali Chavan



Ex Vice President
Dr Vaishali Korde Nayak



Clinical Secretary
Dr Kalyani Ingale



Treasurer
Dr Samidha Dalvi



Jt Secretary
Dr Sandhya Meshram



Jt Clinical Secretary
Dr Meghana Argade



Jt Treasurer
Dr Anagha Pai Raiturkar

MANAGING COMMITTEE MEMBERS



Dr Alka Kshirsagar



Dr Amej Chugh



Dr Akash Thube



Dr Amol Lunkad



Dr Vaibhav Dangat



Dr Madhu Juneja



Dr Charuta Jogalekar



Dr Meenakshi Surve



Dr Nitin Sangamnerkar



Dr Pankaj Sarode



Dr Hemant Deshpande



Dr Manjiri Valsangkar



Dr Kanchan Durugkar



Dr Laxmikant Behele



Dr Kunaal Shinde



Dr Satish Deshmukh



Dr Pandurang Burute



Dr Tanuja Joshi



Dr Vaishali Biniwale



Dr Sanjay Sharma

Nurses Training Program: Surakshit Matrutva Abhiyan: 16th May 2025

On 16 th May 2025, Pune Obgyn society and Chandrapur Obgyn society in association with AMOGS, organised an online webinar to celebrate International nurses day. Dr Kiran Kurtkoti AMOGS President, Dr Manish Machave POGS President and Dr Kalpana Gulwade President COGS, addressed the nurses and wished them on the occasion. The webinar featured 3 lectures and 2 drills . Dr Shilpa Kshirsagar , Dr Uma Wankhede and Dr Girija Wagh from Pune enlightened the audience with their talks in ANC care, Labour , Postpar-

tum period and Lactation. Dr Irshad Shivaji and Dr Deepti Shrirame from Chandrapur threw light on practical aspects through drills on neonatal resuscitation and PPH. Around 100 nurses attended the programme online . A pre test and a post test was conducted online to evaluate the understanding of the topics amongst the nurses. It was extremely well appreciated by the nurses for the academic content covered in a simple manner.

COGS & POGS
IN ASSOCIATION WITH AMOGS
PRESENTS

INTERNATIONAL NURSES DAY

सुरक्षित मातृत्व अभियान **LIVE WEBINAR**

ONLINE WEBINAR

Friday 16 May, 2025 Start From 4:00-6:00 PM Online webinar

Time	Activity
4:00 -4:05 PM	Welcome
4:05 -4:15 PM	Inauguration
4:15 -4:30PM	Pre-test
4:30-5:15PM	Lecture Sessions
5:15 - 5:45 PM	Drills
5:45 - 5:55PM	Post -test
5:55 - 6:00 PM	Vote of thanks

Drills Topics	Speaker
Neonatal Resuscitation	Dr Irshad Shivaji
PPH drill	Dr Deepti Shrirame

Lecture Topics	Speaker
Antenatal care	Dr Shilpa Kshirsagar
Labour guide:	Dr Uma WANKHEDE
Postpartum And lactation:	Dr Vaishali KORDE Nayak

COGS OFFICE BEARERS

- Dr Kalpana Gulwade (President)
- Dr Rucha Padrey (Secretary COGS)
- Dr Priya Shinde (Clinical Secretary COGS)
- Dr Shweta Manwatkar (Treasurer COGS)

POGS OFFICE BEARERS

- Dr Manish Machave (President)
- Dr Nilesh Balkawade (General Secretary)
- Dr Kalyani Ingale (Clinical Secretary)

AMOGS OFFICE BEARERS

- Dr Kiran Kurtkoti (President)
- Dr Bipin Pandit (Secretary General)
- Dr Revati Rane (Chairperson, Public Awareness Committee)

Convenors

- Dr Samidha Dalvi (Treasurer POGS)
- Dr Sandhya Meshram (Secretary POGS)



Dr Meenakshi Deshpande

POGS MEDICOLEGAL MASTERCLASS

WE had a wonderful POGS Masterclass workshop * On Medicolegal Issues* with theme "Better to prepare and prevent than repair and repent.", which was held on 18 May Sunday at Dr. Nitu Mandke IMA Hall , Tilak Road.

POCSO, PCPNDT Unsolved issues by Experts , Dr Kalpana Baliwnt ,AMOH , PMC and Dr Kiran Kurtkoti , President AMOGS facilitated by Dr. Madhu Juneja and Dr Charuta Joglekar .



Gen .Secretary POGS Dr.Nilesh Balkawde welcomed all and appreciated all the delegates for wonderful attendance . With More than 150 registrations the elegant conference hall buzzed with anticipation as attendees settled into their seats, eagerly awaiting the start of the much-anticipated Masterclass.

The FIRST *Aamne Saamne* -session saw active discussions and many take home messages on MTP n

In session 2 , eminent speakers Dr Sudesh Joshi from Pandharpur spoke on Legalities of Sterilization Operations , Dr Varsha Dange , from PCMC elaborated on Hysterectomy Audit and Dr Menakshi Deshpande Convener and Chairman of Medicolegal Committee explained about Indemnity Insurance.



Inauguration was done right on time with our esteemed Guests of Honor :
Dr Nagnath Yempalle, Civil Surgeon and ACP Crime, Mr Shailesh Balkawade



Gynaecologist and obstetrician are doing great job by saving and uplifting Women's Health , but in times of Emergency all the society and security should be helping the doctors to give adequate and proper treatment. Medical emergencies in women are life threatening and doctors and patients should mutually understand each other and also co-operate with police and society , who were Guests of Honor at Inauguration ceremony of the Pune Obstetrics and Gynaecology Society programme . MAGAZINE WOMB AND WELLNESS was released.

President POGS Dr Manish Machave, Gen Secretary POGS Dr Nilesh Balkawade, Treasurer Dr Samidha Dalvi, Chairman POGS Medicolegal Committee Dr Meenakshi Deshpande, Chairman POGS MTP committee Dr Madhu Juneja were on the dais .Dr Anagha Pairaiturkar compered the Inauguration programme .

The SECOND AMNE-SAMNE session The Burning train- Emergency services, referrals, Ethics, Advance payments and deposits started by facilitators Dr Sa-

midha Dalvi & Dr Tanuja Joshi who made sure all burning topics of the day were questioned to the EXPERTS Dr .Sanjay Gupte , Dr Manish Machave , Dr.Meenakshi Deshpande

who really were put to task and topics were thoroughly discussed in details like emergency , handling casualty ,ethics , referring systems and methods , advance payments and life threatening emergencies preparedness and audience too pitched in between with interesting queries and deliberations.

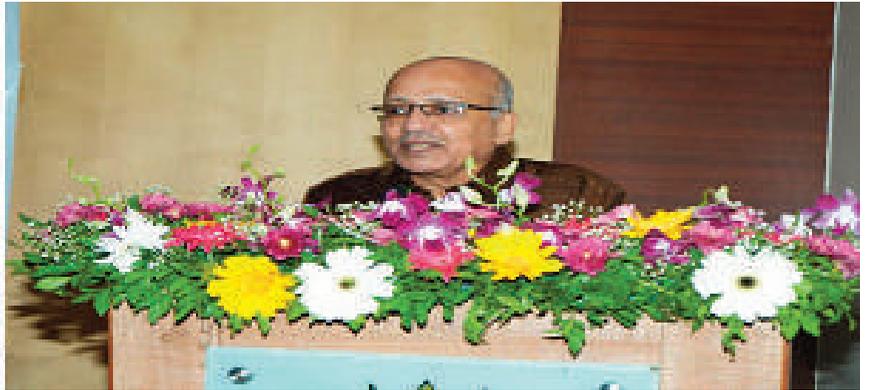
President Dr Manish Machave assured all that POGS stands with the members in any sort of medicolegal Emergency and that the present TEAM POGS has left no stone unturned to help Dr Sushrut Ghaisas in his dire need .



Session 3 saw that Criminal vs Civil negligence was very well addressed by Adv.Rohit Erande , an eminent practicing Lawyer whereas Notice recd- what next was nicely explained by Dr.Jayant Navarange, a senior Paediatrician, Medicolegal Expert and IMA Activist.



Maternal death and Stillbirth was exhaustively discussed by Dr. Manish Machave , president POGS & Past Chairman Medicolegal Committee FOGSI and Media trial by Dr. Girish Kumthekar, an eminent gynaecologist and medicolegal expert from Solapur.



Lastly, in session 4 a very interesting session on step by step Examination of Victim of sexual abuse was taken by Dr Uma Wankhede and Dr.Milind Sonawane. All the delegates appreciated the academivc deliberations , excellent food platter and the generalized ambience of the masterclass . the attendees were allotted 2 MMC POINTS , 5 ICOG AND MCOG POINTS.

पीओजीएसतर्फे मेडिकोलीगल मास्टरक्लास
पुणे : पुणे ऑब्स्टेट्रिक्स अँड गायनेकोलॉजी सोसायटी (पीओजीएस) तर्फे नुकतेच टिळक रस्त्यावरील आयएमए हॉलमध्ये 'बेटर टू प्रीपेर अँड प्रिव्हेंट दॅन रिपेअर अँड रिपीट' या संकल्पनेवर आधारित मेडिकोलीगल मास्टरक्लास आयोजित करण्यात आला होता. या कार्यक्रमाला १५५ हून अधिक स्त्रीरोगतज्ज्ञ सहभागी झाले होते. कार्यक्रमाच्या उद्घाटन समारंभाला प्रमुख पाहुणे म्हणून वरिष्ठ पोलिस अधिकारी शैलेश बलकवडे आणि सिव्हिल सर्जन डॉ. नागनाथ येम्ले उपस्थित होते. शैलेश बलकवडे यांनी डॉक्टरांनी कायदेशीर मार्गदर्शक तत्वांनुसार काम करावे, यावर भर दिला आणि वैद्यकीय समुदायाला पोलिसांच्या मदतीचे आश्वासन दिले. ते म्हणाले की, पुणे पोलिसांनी व्हाॅट्सप ग्रुप तयार केले आहेत जिथे डॉक्टर कोणत्याही समस्यांबाबत थेट तक्रार करू शकतात जेणे करून त्यांना तत्काळ मदत उपलब्ध होऊ शकते. यावेळी त्यांनी पीसीपीएनडीटी, पॉक्सो आणि एमटीपी कायद्याशी संबंधित प्रमुख मुद्द्यांवर स्पष्टता आणि मार्गदर्शन केले.



NEWS about Medico Legal Masterclass:

सुबई सरुण भारत
 Pune Edition | 2025-05-23 | Page-2
 epaper.mahamth.com

'पीओजीएस' तर्फे मेडिको-लीगल मास्टरक्लास संपन्न

पुणे, दि. २२ : प्रतिनिधी
 'पुणे ऑब्स्टेट्रिक्स अँड गायनेकोलॉजी सोसायटी' (पीओजीएस)ने मुंबई टिळक रस्त्यावरील आयएमए हॉलमध्ये 'बेटर टू प्रीपेर अँड प्रिव्हेंट दॅन रिपेअर अँड रिपीट' या संकल्पनेवर आधारित मेडिको-लीगल मास्टरक्लास आयोजित करण्यात आला होता. या कार्यक्रमात १५५ हून अधिक स्त्रीरोगतज्ज्ञ सहभागी झाले होते. कार्यक्रमाच्या उद्घाटन समारंभाला प्रमुख पाहुणे म्हणून वरिष्ठ पोलिस अधिकारी शैलेश बलकवडे आणि सिव्हिल सर्जन डॉ. नागनाथ येम्ले उपस्थित होते.

शैलेश बलकवडे यांनी डॉक्टरांनी कायदेशीर मार्गदर्शक तत्वांनुसार काम करावे, यावर भर दिला आणि वैद्यकीय समुदायाला पोलिसांच्या मदतीचे आश्वासन दिले. ते म्हणाले की, पुणे पोलिसांनी व्हाॅट्सप ग्रुप तयार केले आहेत जिथे डॉक्टर कोणत्याही समस्यांबाबत थेट तक्रार करू शकतात जेणे करून त्यांना तत्काळ मदत उपलब्ध होऊ शकते. यावेळी त्यांनी पीसीपीएनडीटी, पॉक्सो आणि एमटीपी कायद्याशी संबंधित प्रमुख मुद्द्यांवर स्पष्टता आणि मार्गदर्शन केले.

पुणे ऑब्स्टेट्रिक्स अँड गायनेकोलॉजी सोसायटी (पीओजीएस)

'डॉक्टरांनी मार्गदर्शक तत्वांनुसार काम करावे'

पुणे, ता. २७ : 'पुणे पोलिसांनी व्हाॅट्सअप ग्रुप तयार केले आहेत. त्यावर डॉक्टर कोणत्याही समस्यांबाबत थेट तक्रार करू शकतात. डॉक्टरांनी कायदेशीर मार्गदर्शक तत्वांनुसार काम करावे,' असे मत नुकतीच मुंबई येथे बंदली झालेले पुण्याचे गुन्हे विभागाचे अतिरिक्त पोलिस आयुक्त शैलेश बलकवडे यांनी व्यक्त केले.

पुणे ऑब्स्टेट्रिक्स अँड गायनेकोलॉजी सोसायटी (पीओजीएस) तर्फे संकल्पनेवर आधारित कायदेशीर वैद्यकीय प्रक्रियांवर चर्चासत्र (मेडिकोलीगल मास्टरक्लास) आयोजित केले होते. टिळक रस्त्यावरील आयएमए हॉल येथे झालेल्या या कार्यक्रमात १५५ हून अधिक स्त्रीरोगतज्ज्ञ सहभागी झाले होते. चर्चासत्राच्या उद्घाटन समारंभाला प्रमुख पाहुणे म्हणून अतिरिक्त पोलिस आयुक्त शैलेश बलकवडे आणि जिल्हा शल्यचिकित्सक डॉ. नागनाथ येम्ले उपस्थित होते. डॉ. येम्ले यांनी आपत्कालीन परिस्थितीत डॉक्टर, रुग्ण आणि समाज यांच्यातील परस्पर समजसंपणाचे महत्त्व अधोरेखित केले. या चर्चासत्राचे नेतृत्व 'पीओजीएस'चे अध्यक्ष डॉ. मनीष माचवे, सचिवांनी डॉ. नीलेश बलकवडे, खजिनदार डॉ. समिधा दळवी, मेडिकोलीगल समितीच्या अध्यक्षा डॉ. मौनाक्षी देशमांडे आणि 'एमटीपी' समितीच्या अध्यक्षा डॉ. मधू जुनेजा यांनी केले.



Dr Meenu Agarwal
Past President POGS

FERTILITY ENHANCING ENDOSCOPIC SURGERIES

INTRODUCTION:

Subfertility is "a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse" according to the International Committee for Monitoring Assisted Reproductive Technology (ICMART) and the World Health Organization (WHO) revised glossary of assisted reproductive technology. Any factor which might distort the normal anatomy of female pelvis or uterine cavity could lead to the impairment of fertility potential. These significant proportions of patients have structural or pathological causes which can be potentially treated by surgery. With the advance of minimally invasive endoscopic surgeries like laparoscopy and hysteroscopy it has become easier to reconstruct the pelvic anatomy and improve the fertility potential of majority of patients. However, comprehensive assessment of subfertile couples with detailed infertility work up is mandatory before proceeding with any reconstructive surgery to exclude any other factors which might change the management plan.

Types of endoscopic surgeries to enhance fertility:

A. Laparoscopy

B. Hysteroscopy

Indications for hysteroscopy laparoscopy in infertility:

- Woman aged > 25 years, married for 3 years with unprotected coitus.
- Unexplained infertility
- Known pelvic factors like
 - Abnormal or suspicious hysterosalpingography
 - Blocked tubes
 - Tubo ovarian adhesions
 - Myoma
 - Endometriosis
 - Polycystic ovarian disease
 - Suspected or known mullerian anomalies
 - Routinely before in vitro fertilisation.

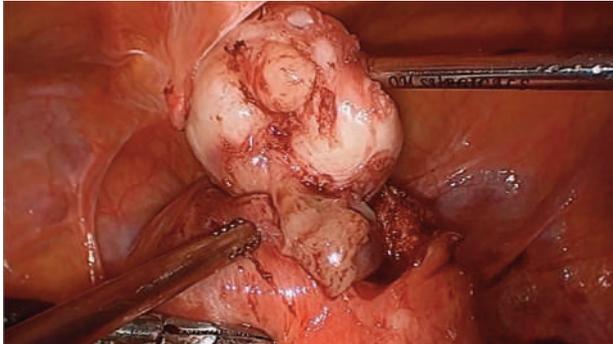
LAPAROSCOPIC FERTILITY ENHANCING SURGERIES:

1. Laparoscopic myomectomy:

Uterine fibroids are the most common pelvic tumor, occurring in about 70% of women by age 45. However, many fibroids are small and asymptomatic. About 25% of white and 50% of black women have symptomatic fibroids. Fibroids are benign tumors of the muscle of the uterus most myomas do not cause clinical symptoms and do not require intervention. Based on location the various types of myoma are subserous, intramural and submucous fibroid. Most frequently, they develop in the myometrial wall and can lead to uterine distortion. Myomas can cause infertility as they lead to distortion of endometrial cavity, mechanical interference with implantation, pose a problem with spermascent and embryo transport, focal endometrial vascular and endocrine disturbances, endometrial inflammation, and abnormal uterine contractility.

According to statistics removal of submucosal fibroids improves fertility, but removal of subserosal myomas has no role in improving fertility of the patient. There are great uncertainties about the relationship between intramural fibroids and fertility. Benecke et al, have suggested that intramural fibroids should be removed, if they are close to the endometrium (<1 cm) and larger than 20mm.

During the past few years, there have been a number of studies advancing the knowledge about the efficacy and safety of treatments of myomas, including medical and minimally invasive therapies. Laparoscopic myomectomy was first described by Semm and Metler in 1980 for subserosal fibroid there is an increasing trend for minimal access surgery for treatment of uterine myomas. Laparoscopic myomectomy is a very recent advance in the field of gynaecological surgery. Laparoscopic myomectomy has provided a minimal invasive alternative to laparotomy with advantage of faster recovery and less postoperative adhesions. Laparoscopic myomectomy (LM) is an ef-



fective technique that is associated with the development of operative laparoscopic equipment and surgical techniques. The size does not matter for performance of a myomectomy laparoscopically. Laparoscopic myomectomy has evolved into a safe, efficient, and cost effective approach for the treatment of intramural, subserosal, and pedunculated fibroids. Criteria for myomectomy for surgical intervention, supported by the American College of Obstetricians and Gynecologists (ACOG) and American society for reproductive medicine (ASRM) are:

Clinically apparent myomas that are a significant concern to the patient even if otherwise asymptomatic;

- Myomas causing excessive bleeding and/or anemia;
- Myomas causing acute or chronic pain; and
- Myomas causing significant urinary problems not due to other abnormalities;
- Infertility with distortion of the endometrial cavity or tubal occlusion.

Before myomectomy, Hysteroscopy is performed in most patients at the outset of the procedure, than all pelvic structures and the abdominal cavity are inspected

2.Laparoscopic Tubal surgeries:

Tubal disease or damage to fallopian tubes accounts for 25-35% of cases of infertility, majority of which is due to salpingitis. There are various surgical options for achieving patency in obstructed fallopian tubes depending upon the site of blockade. Although hysterosalpingography is first line of tests to check for tubal patency, hysteroscopy is gold standard.

• Surgery for proximal tubal disease:

It accounts for about 10-25% of tubal disease. A meta-analysis of studies suggest that 85% patients had bilateral proximal tubal occlusion and half of the patient conceived after tubal cannulation. Hysteroscopic cannulation has increased the pregnancy rates, although tubal patency rates are similar to fluoroscopic and hysteroscopic techniques.

• Surgeries for distal tubal disease:

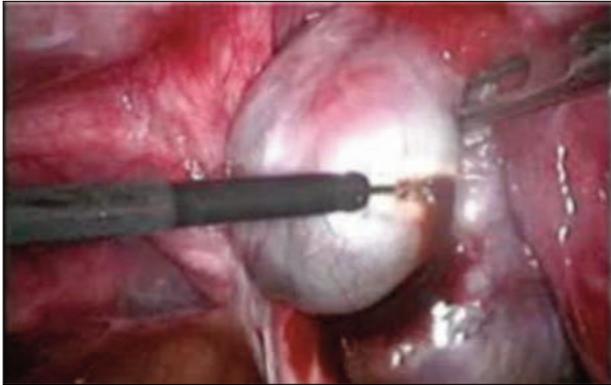
Tubal repair or salpingectomy is performed depending upon intraoperative findings. It includes hydrosalpinges and fimbriae phimosi. Both conditions can be due to PID, peritonitis or previous surgery leading to tubal blockage. Salpingostomy increases the chances of conception in older woman. It is also considered better option in male factor infertility. It improves the success rate of IVF in patients with mild hydrosalpinx. Salpingectomy followed by IVF is mainstay of treatment for patients with severe hydrosalpinx. Alternative methods are laparoscopic clipping of tubes and hysteroscopic occlusion of ostia, however best results are obtained with salpingectomy followed by IVF.

• Tubotubal reanastomosis by laparoscopic microsurgery:

Tubal sterilisation is the most popular form of birth control methods in India. But for some unforeseen reasons, women may seek for reversal of sterilisation. Now a days laparoscopic microsurgery is considered as the gold standard. Age of woman is important prognostic factor while considering tubal reanastomosis. In women younger than 40 years of age, the cumulative rates of intrauterine pregnancy in 2 years are 70% compared with more than 90% after microsurgical reversal of tubal sterilisation.

3.Laparoscopic adhesiolysis and pelvic anatomy restoration:

Adhesions are the bands of fibrous tissue that form as a result of healing process after the original inflammation or trauma has healed. Pelvic adhesions are one of the leading causes of female infertility. Almost 15-20% female infertility is attributed to pelvic adhesions. Causes of pelvic adhesions could be due to pelvic inflammatory diseases, endometriosis, history of an abdominal or pelvic surgery, complicated appendicitis, and inflammatory bowel disease. Less commonly it could be due to radiotherapy, bacterial peritonitis and



foreign body reactions. Adhesions affect fertility adversely by distorting adnexal anatomy and interfering with gamete and embryo transport. Peritubal adhesions may occlude the tube and may in turn impair tubal motility which in turn leads to defective ovum pick up and embryo arrival into the uterus, either resulting in infertility or ectopic pregnancy. Periovarian adhesions prevent proper follicular growth and ovulation.

Adhesiolysis is the surgical procedure in which adhesions are lysed to restore normal anatomy distorted by adhesions. It is performed laparoscopically. Adhesiolysis aims to restore tubo ovarian relationship as much as possible.

Evidence proved that adhesiolysis can improve pregnancy outcomes.

4. Endometriosis and infertility: Management

Endometriosis is a disease characterised by presence of endometrial tissue outside the uterus. It is chronic inflammatory condition resulting in formation of adhesions and fibrosis in the pelvis. According to American Society for Reproductive Medicine, endometriosis may be found in up to 50% of infertile women. By and large laparoscopy has become gold standard for diagnosis and treatment of endometriosis

According to ESHRE 2022 guidelines, decision to perform surgery for endometriosis should be guided by the presence or absence of pain symptoms, patients' age and preferences, history of previous surgery, presence of other infertility factors, ovarian reserve, and estimated endometriosis fertility index (EFI)

5. Laparoscopic ovarian drilling:

Polycystic ovarian syndrome (PCOS) is common entity in women of reproductive age. The incidence varies from 3 to 15% of women in reproductive age group. The insulin resistance with compensatory hyperinsulinemia is a prominent feature of the syndrome and

seems to have pathophysiological role in hyperandrogenism.

First line of management is lifestyle modification, increase in physical activity, and loss of at least 10% of body weight. This may be combined with ovulation induction drugs like clomiphene citrate or aromatase inhibitors like letrozole. Ovarian drilling is indicated in clomiphene resistant cases. It can be performed laparoscopically.

For laparoscopic ovarian drilling, monopolar needle is used. 10-12 holes are made in each moderately enlarged ovaries with 40 watts of pure cutting current. The punctures made are 2-3mm deep with monopolar cautery time of just 2 seconds. Mechanism of induction of ovulation by ovarian drilling is not exactly understood. There are different theories proposed. Stein and Leventhal postulated that bilateral ovarian wedge resection decreases mechanical crowding of cortex by cysts, which enables the progress of normal Graafian follicles to the surface of ovary.

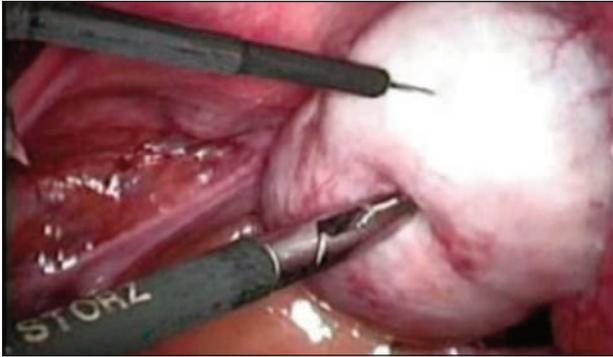
Active management is done for future fertility and patients are allowed to conceive immediately after ovarian drilling surgery. Minimal required stimulation with clomiphene or letrozole is given as ovaries are now receptive to lower dose. Almost 80% pregnancy rates are achieved (Gjonnaess et al)

HYSTEROSCOPIC FERTILITY ENHANCING SURGERIES:

The prevalence of uterine abnormalities in patients with infertility is as high as 50%. Therefore, evaluation of a couple with infertility should include assessment of endometrial cavity. Observational studies suggest higher pregnancy rates after the hysteroscopic removal of endometrial polyps, submucous fibroids, uterine septum or intrauterine adhesions, which are present in 10% to 15% of women seeking treatment for subfertility. Uterine abnormalities, including congenital pathologies, polyps, submucous leiomyomata, intrauterine adhesions, and chronic endometritis, have been reported in 21 to 47% of patients undergoing in vitro fertilization cycles.

1. Hysteroscopic myomectomy:

The incidence of submucous myoma in infertile women without any obvious cause of infertility is estimated to be between 1 and 2.4%. Operative hysteroscopy has recently provided a better alternative for resection of submucous myomata transcervically, thus avoiding the drawbacks of traditional laparotomy and uterine incision. The standard technique entails slicing



of submucous myoma from its top towards its base using cutting loop of resectoscope.

Surgical management with hysteroscopic myomectomy has been reported to yield pregnancy rates of around 45% in infertile women. For patients with recurrent miscarriage and intracavitary fibroids, surgery increases the rates of viable pregnancy outcomes.

2. Hysteroscopic tubal cannulation for proximal tubal block:

About 5-20% of hysterosalpingograms reveal proximal tubal occlusion. True occlusions could be due to salpingitis, endometriosis, or congenital malformations. Another type is apparent proximal occlusion due to tubal spasm at the time of HSG. Due to high incidence of false positives, HSG findings of proximal tubal occlusion should be followed by selective catheterisation. The cumulative pregnancy rate after tubal catheterization is 28% at 12 months follow up. Approximately 20% of tubes cannot be catheterised; such patients are best treated by IVF.

Hysteroscopic cannulation is done by flexible guide-wire through a catheter through operating hysteroscope.

3. Hysteroscopy for Metroplasty in septate uterus:

Congenital uterine anomalies also called as mullerian anomalies refer to the structural defects that affect the shape and size of the uterine cavity resulting into poor reproductive outcome. Uterine septum is the most common uterine anomaly accounting for > 50% of all anomalies. It results from failure of resorption of part between the two mullerian ducts during embryological development. The highest rate of recurrent pregnancy loss, and poor obstetric outcomes like preterm labour, intrauterine fetal growth restriction, fetal malpresentations and retained products of conception is associated with septate uterus. It was postulated that septum creates irregular contractile patterns that expels and implanted embryo or prevents implantation. It

was also found that found that endometrium overlying the septum is poor in hormonal receptivity which might waver its ability to accept embryos. Being poor in blood supply explains the cause of repeated spontaneous abortions.

Hysteroscopic metroplasty has significantly improved the reproductive outcomes in patients with septate uterus. Septum may be incised by scissors or using resectoscope. It has been proved that metroplasty improves the pregnancy rates, live birth rates and reduces abortion rates significantly. Metroplasty improves pregnancy outcomes in patients with recurrent spontaneous abortions and in unexplained infertility. Incising a uterine septum improves the results of IVF cycles.

4. Hysteroscopic metroplasty for Hypoplastic uterus:

Hypoplastic uterus with cylindrical uterine cavity and a bulging of uterine side walls alone or in combination with adverse pregnancy outcomes in terms of primary infertility, recurrent pregnancy loss, or preterm delivery is an indication for metroplasty. Hook is introduced into the uterine cavity and incision is made from fundus to isthmus and two lateral walls until a normal triangular and symmetric uterine cavity is obtained. Sequential use of estrogen and progesterone is prescribed for a period of 2 months and a repeat diagnostic hysteroscopy can be performed after that.

5. Hysteroscopy for intrauterine adhesions (Asherman's syndrome):

Intrauterine adhesions or synechia are the bands of fibrous tissue that form within uterine cavity resulting in distortion of cavity with subsequent impairment of reproduction and menstrual patterns. > 90% of adhesions occur after curettage. Rarely, endometrial tuberculosis destroys the uterine lining which heals thereafter by secondary infections resulting in intrauterine adhesions.

Hysteroscopic adhesiolysis is the mainstay of treatment. It is done using mechanical scissors hysteroscopically. The overall pregnancy rates after hysteroscopic adhesiolysis is 43%, with a live birth rate of 32%.

6. Hysteroscopic polypectomy:

Endometrial polyps are localized hyperplastic overgrowths of glands and stroma that project from the surface of endometrium. Hysteroscopic resection is the gold standard treatment for endometrial polyps. It was shown in the studies that hysteroscopic polypectomy improves fertility and increases pregnancy rates, irrespective of size or the number of the polyps.



Dr Ashish Kale
MD, DNB, MNAMS,
FICOG, FICMCH

Energy Sources in Hysteroscopy and Laparoscopy

INTRODUCTION

Hysteroscopy and laparoscopy have transformed gynecological surgery by enabling precise, minimally invasive interventions. Central to their success is the effective use of energy sources for cutting, coagulation, dissection, and hemostasis. Careful selection of the appropriate energy modality enhances surgical outcomes while minimizing complications such as thermal injury and adhesion formation.

ENERGY SOURCES IN HYSTEROSCOPY

The use of energy to perform intrauterine surgery can be broken down into three fundamental elements: delivery, transmission, and tissue strike. Thermal delivery devices, including monopolar or bipolar electrodes and quartz fibers, transmit energy either directly or indirectly to tissue. Transmission is unaffected, facilitated, or deterred by the distention medium that fills the intrauterine cavity. The final targeted-tissue effects represent the complex summation of energy type and concentration; treatment time; tissue constituents and hydration; and the convective currents created by tissue vascularity and circulating distention medium. Efficiency, safety, and efficacy are inextricably linked to the thoughtful orchestration of all of these elements. The responsibilities to know how and why are only stepping stones to attaining the best surgical result. We are reminded that surgery transcends technique only when experience and judgment are coupled with fundamental knowledge. Only then can science become art in the hands of the hysteroscopic surgeon. Hysteroscopy, especially operative hysteroscopy, utilizes various energy sources to achieve surgical effects like tissue resection, ablation, or coagulation. Hysteroscopic surgery requires precise energy delivery within the confined uterine cavity. The primary energy sources include electrosurgical (monopolar and bipolar) energy, laser energy, and potentially microwave energy. Other sources include mechanical, ultrasonic, and plasma energies

Monopolar Electrosurgery

Monopolar energy has long been used in hysteroscopy for tissue resection. It requires non-conductive distension media (glycine, sorbitol), increasing risks of fluid overload and electrolyte imbalance (Munro & Storz, 2015). Moreover, thermal spread may cause unintended injury.

Bipolar Electrosurgery

Bipolar energy allows the use of normal saline as distension medium, reducing systemic risks (Mettler et al., 2006). It provides effective cutting and coagulation with lower thermal injury, making it the current standard for many procedures such as myomectomy and polypectomy.

Laser Energy

Lasers, including Nd:YAG and KTP lasers, offer highly precise tissue ablation with minimal collateral damage (Di Spiezio Sardo et al., 2010). However, high costs and complex equipment requirements limit widespread clinical use.

Other Energy Sources:

Mechanical: Mechanical instruments like scissors, biopsy forceps, and grasping instruments are used for cutting, removal, and manipulation of tissues.

Ultrasonic: Ultrasonic energy is used in some cases for tissue disruption and ablation.

Plasma: Plasma energy can be used for tissue vaporization and ablation.

Microwave: Microwave energy is sometimes used in ablation therapy.

In summary, operative hysteroscopy utilizes a combination of energy sources, including electrosurgical, laser, and other modalities, to achieve various surgical effects, with the choice of energy and distension media depending on the specific procedure and desired outcome.

ENERGY SOURCES IN LAPAROSCOPY

Laparoscopy utilizes various energy sources to cut, coagulate, and dissect tissues, including electrical, laser, ultrasonic, and mechanical energies. These energy sources are chosen based on the surgeon's preference and the

specific requirements of the procedure, all working on the principle of causing tissue destruction and haemostasis. The past decade has seen continual advances in electro-surgical techniques and devices. The newer bipolar and ultrasonic devices with their advanced vessel sealing properties, better coagulation and transection abilities have heralded a revolution in laparoscopic surgery. The choices available to a laparoscopic surgeon are varied, ranging from basic unipolar and bipolar devices to the more advanced bipolar devices and ultrasonic technology-based ones. This underlines the importance of thorough knowledge regarding mechanism, efficacy and safety of the available energy sources.

Guidelines for that Utilization of Electro-surgery in Laparoscopic Applications

1. Avoid using over 30 W of power.
2. Injury can be reduced by lowering the "on" time of the current. This really is controlled by the surgeon using whether handpiece or perhaps a foot pedal.
3. Use electrode geometry to attain precise coagulation or cutting. Choose a smaller contact patch to achieve cutting and a larger contact patch to achieve coagulation.
4. The tissue needs to be positioned on tension to attain cutting.
5. Use the thin wire electrodes to cut. Thick wire electrodes perform poorly simply because they tend to cause coagulation, and cutting and coagulation can't be properly achieved. Thinner wire electrodes may be used for precise bloodless dissection.
6. The foot switch or hand switch ought to be activated for brief periods only. When the current is on long, the chance of remote site electrical injury is increased (in case it comes with an unrecognized insulation failure)
7. If the surgeon observes blanching of tissue, a precursor of charring, an excessive amount of power has been used. Charring should be avoided.
8. The use of the hook could be summarized as - "HOOK, LOOK, COOK"

Monopolar Electro-surgery

Monopolar energy remains popular form of electro-surgical technique employed in laparoscopy for basic cutting and coagulation due to its efficacy, versatility. However, its lateral thermal spread increases risks of damage to adjacent structures (Shea et al., 2014). Disadvantages of Monopolar Electro-surgery: The most dreaded complication with monopolar electro-surgical techniques is arcing of the current resulting in undi-

agnosed severe injuries. They can also result in extensive diathermy burns if the return electrode is not properly applied. Monopolar electro-surgical techniques can interfere with pacemaker function and care should be taken to avoid them in such patients.

Bipolar Electro-surgery

In Bipolar electro-surgical devices, the active and return electrode are formed by the two jaws of the energy source. The concept was initially introduced in 1974 and the initial usage of bipolar devices was confined to the coagulation or sealing of small blood vessels with a maximum diameter of 2-3 mm. The main advantage of bipolar over monopolar electro-surgery is the ability to seal vessels upto 5 mm in diameter vis-a-vis monopolar which is generally suited for vessels 1-2 mm. The dissection capability of bipolar forceps is also good. Disadvantages of Bipolar Electro-surgery Bipolar devices use only coagulation current, which is responsible for their major drawback of lateral thermal spread. This can result in inadvertent electrical burns. Other technical drawbacks include tissue adherence to instrument jaws and requirement of another instrument for tissue cutting, which is cumbersome and increases operating time. Current leakage, damage to another tissue which comes into contact with heated tissue, and interference with pacemaker function are other common drawbacks. Advanced bipolar systems such as LigaSure provide superior vessel sealing with reduced thermal spread (Landman et al., 2003). They are widely used in laparoscopic hysterectomy, endometriosis surgery, and adnexal procedures.

Advanced bipolar devices

Newer Bipolar devices combine the principle of thermo-fusion, with application of optimal mechanical pressure to ensure that the denatured protein forms a coagulum and a strong seal is achieved. Large vessels, upto a diameter of 7 mm, and large tissue bundles can now be surgically sealed.

Advanced electrogenerators are available which sense tissue impedance and automatically control current flow by adjusting voltage and current continuously. Once the intended sealing level has been reached, an audio signal alerts the surgeon that the result has been achieved. This guards against prolonged device activation, decreases tissue charring and adherence to the instrument. It also reduces lateral spread of current, which makes these devices extremely safe to use especially in pelvic dissection.

1. Enseal (Ethicon Endo-surgery, US, LLC): It combines a

high compression jaw with a tissue dynamic energy delivery system that results in tissue sealing and hemostasis. It has a blade that can seal vessels and lymphatics upto a diameter of 7 mm, and simultaneously cuts the sealed tissue.

2. LigaSure Vessel Sealing Technology (Medtronic): It has the ability to sense when the sealing effect is achieved and automatically cuts off energy supply. It can efficiently seal blood vessels and undissected tissue bundles upto a diameter of 7mm. The device provides a combination of pressure and energy to denature proteins, forming a true, permanent, seal rather than just creating a proximal thrombus (as happens in traditional bipolar electrocautery). Its lateral thermal spread is purported to be 2 mm. This unique energy output leads to virtually no sticking or charring, and also the seals can withstand three times normal systolic blood pressure level.



Development of ultrasonic devices

Although traditional electrosurgical instruments revolutionized laparoscopic surgery, they did have inherent disadvantages such as generation of considerable smoke plume, which absorbs light and results in obscuration of vision. To counteract this, high flow suction is required during surgery, which lead to rapid loss of pneumoperitoneum, and further restricts the field of vision. In order to overcome shortcomings of traditional devices, investigators continued to look for alternative options. It was in 1993, that Amaral introduced the first ultrasonic energy source and dubbed it 'laparoscopic scalpel' owing to its double functions of tissue cutting and vessel sealing. Ultrasonic energy sources work on the principle of conversion of electrical energy into vibrations in hand piece of device. These vibrations are above the audible range, with a frequency of more than 20,000 cycles per second.

This results in oscillation of the non-articulating jaws of

the instrument, which impart tissue effects of heat and cutting. The tissue, which is compressed between an articulating and a non-articulating jaw, undergoes desiccation and vessel sealing at lower frequencies and tissue cutting at higher frequencies. Tissue effects are essentially the same as achieved with contact monopolar or bipolar electrosurgery with the additional function of tissue cutting. However, ultrasonic energy sources achieve these effects without passage of electrical current through the patient or through the grasped tissue.

The Ultrasonic instruments are a technological advancement and combine many of the best qualities of monopolar and bipolar instruments with enhanced safety. Ultrasonic surgical dissection allows coagulation and cutting with less instrument traffic (reduction in operating time), less smoke with no electrical current.

- Mechanical energy at 55,500 vibrations / sec.
- Disrupts hydrogen bonds & forms a Coagulum
- Temperature by Harmonic Scalpel-80-100 ° C
- Temperature through Electro coagulation-200-300 ° C
- Minimum Collateral damage,
- Less tissue necrosis.
- disadvantages are expenditure involved and limited lifespan of the ultrasound tip, which requires these instruments to be disposable.

Harmonic [ethicon, Johnson & Johnson, us, I.I.c.]

The Harmonic Scalpel Shears was introduced in 1998 (Fig. 3). Harmonic energy, delivered via devices like the Harmonic Scalpel, uses high-frequency ultrasonic vibrations (typically 55.5 kHz) to simultaneously cut and coagulate tissues (Hayashi et al., 2012). This mechanical energy causes protein denaturation and coagulum formation, sealing vessels up to 5 mm in diameter. It can also be used for fine dissection (termed Ultrasonic) and cutting of tissue simultaneously. This allows quicker surgery because the instrument need not be changed.

Advantages of Harmonic energy include:

- Lower operating temperatures (~50–100°C) compared to electrosurgery.
- Minimal lateral thermal spread — safer dissection near delicate structures such as ureters and bowel.
- Reduced smoke generation — better surgical field visibility.
- Precise dissection in areas with dense fibrosis or adhesions.

Studies show that Harmonic devices lead to shorter operative times, less blood loss, and faster recovery in laparoscopic gynaecologic surgeries (Hayashi et al.,

2012; Thompson et al., 2018). They are especially valuable in complex surgeries such as deep infiltrating endometriosis and advanced laparoscopic hysterectomy. The latest offering by Ethicon, that is hailed as a major advancement in Ultrasonic devices is Harmonic ACE+7 Shears. The makers claim that the median burst pressures in Advanced Hemostasis mode are much higher than other devices, including Thunderbeat, enabling the device to coagulate vessels upto 7 mm in diameter (FDA Approved). The refinement in blade designs has enhanced surgical precision and device performance with minimal lateral thermal spread of 1 mm.



Hybrid Energy Systems

Newer devices combining bipolar and ultrasonic technologies further improve surgical efficiency and versatility (Thompson et al., 2018). Thunderbeat (olympus medical systems corp., tokyo, japan) It was the first device to integrate both advanced bipolar energy and ultrasonically generated frictional heat energy in one instrument. There are two modes in the generator, level 1 (ultrasonic technology) for precise dissection and cutting and level 3 (bipolar technology) for vessel sealing. It can seal vessels upto 7mm in size. When Thunderbeat was introduced, it was claimed to have the highest median burst pressure and the least lateral thermal spread.



Laparoscopic guided ablation

Laparoscopic guided ablation is a minimally invasive surgical procedure used to treat various conditions, often by targeting and destroying tissue with heat. Clinical application in management of fibroids, tumours. Benefits include Less Pain and Recovery, Precise Targeting, Repeatability, may be preferred for patients who are not suitable for major surgery due to age, health conditions, or other factors.

Different types of energy can be used, including:

- Radiofrequency (RFA): Uses high-frequency electrical currents to heat and destroy tissue.
- Microwave (MW): Uses electromagnetic waves to heat tissue, causing coagulation necrosis.
- Cryosurgery (Cryoablation): Uses extremely cold temperatures to freeze and destroy tissue.

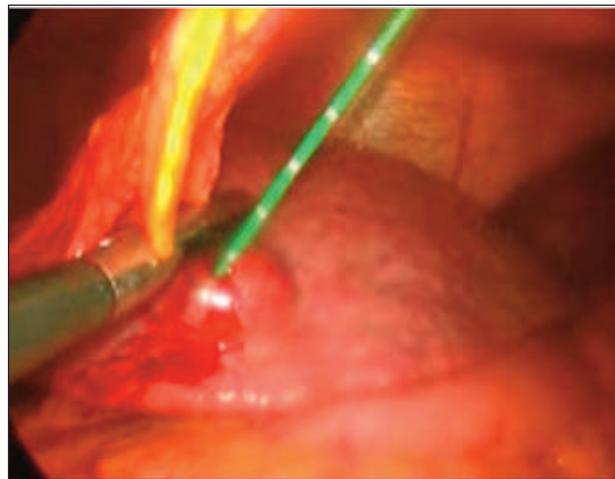


Figure showing laparoscopic guided MW ablation

Shortcomings of energy devices

Few limitations or complications related to energy devices are an inevitable reality of laparoscopy, it is important to have a systematic awareness of the types of complications, know how to respond appropriately, and know how to communicate and deal with complications. All laparoscopic energy sources, to a lesser or greater extent cause lateral thermal spread, irrespective of vaporization, fulguration, desiccation, or coaptation effect; a temperature beyond the "cell kill" threshold may occur causing inadvertent tissue damage increasing morbidity and mortality. Smoke or vapor plumes hampering visibility is mostly observed with monopolar, whereas least seen with ultrasonic devices. Second most common complication associated with laparoscopy surgery after veress or trocar place-

ment (41.8%) are related to use of electro-surgical devices (25.6%). Possible mechanisms behind injuries are mistaken target application, stay current injury due to defective insulation, direct coupling (when active electrode touches another metal instrument), capacitive coupling, alternative site burns (due to defective dispersive pad). Though rare, injury to ureter, bladder and bowel have been reported with insidious use of energy devices. To prevent possible complications, it is very important to understand mechanism, biophysics, functions and possible injuries of each instrument.

CONCLUSION

The evolution of energy sources has greatly expanded the capabilities of hysteroscopic and laparoscopic surgery. Electrosurgical technology is constantly being updated and newer devices being launched. However, for best utilization of the technology, the surgeon needs to master the basics of electrosurgery. We have a range of advanced energy devices at our disposal to assist in maintaining high standards of patient care. They decrease surgical time and increase range and versatility of surgical procedures. Having said that, it is the surgeon's comfort, nature of task, device availability and cost effectiveness that will ultimately determine which energy device is used. Traditional devices will nevertheless, continue to be used due to dissection capabilities, availability and best resource utilization. Continued innovation will likely further refine energy-based technologies, enhancing the safety and efficacy of minimally invasive gynecological surgery.

References

- Di Spiezio Sardo, A., Bettocchi, S., Spinelli, M., et al. (2010). Review of new office-based hysteroscopic procedures. *Minerva Ginecol*, 62(1), 1–9.
- Hayashi, S., Noda, K., Horiuchi, A., et al. (2012). Comparison of ultrasonic and advanced bipolar devices in laparoscopic surgery. *J Minim Invasive Gynecol*, 19(4), 454–457.
- Landman, J., Kerbl, K., Rehman, J., et al. (2003). Comparison of monopolar electrocautery, bipolar electrocautery, Harmonic Scalpel, and LigaSure in the porcine model. *J Am Coll Surg*, 197(3), 353–358.
- Mettler, L., Audebert, A., Lehmann-Willenbrock, E., et al. (2006). Prospective randomized comparison of bipolar versus monopolar resectoscopy in the treatment of submucous myomas. *Hum Reprod*, 21(1), 219–223.
- Munro, M. G., & Storz, K. (2015). Hysteroscopic surgery and fluid management. *Obstet Gynecol Clin North Am*, 42(4), 593–603.

- Shea, G. O., Chang, E. J., & Gehrich, A. P. (2014). Electrosurgery principles and practice in minimally invasive gynecologic surgery. *Clin Obstet Gynecol*, 57(3), 475–486.
- Thompson, K. P., Garrett, K. A., & Green, I. C. (2018). Hybrid energy devices in minimally invasive surgery. *Surg Endosc*, 32(6), 2510–2518.
- Milic A, Asch MR, Hawrylyshyn PA, Allen LM, Colgan TJ, Kachura JR, Hays EB. Laparoscopic ultrasound-guided radiofrequency ablation of uterine fibroids. *Cardiovasc Intervent Radiol*. 2006 Jul-Aug;29(4):694-8. doi: 10.1007/s00270-005-0045-9. PMID: 16502165.



Dr Subhash Mallya
MS OBGY, DNB, FRM
Consultant Minimal
Access Surgeon De-
partment Of Obg,
Baby Memorial
Hospital And CVS
Hospital, Calicut ,
Kerala



Dr Divya TN
Senior Resident
Department Of OBG.

LAPAROSCOPIC MYOMECTOMY- TIPS AND TRICKS

Uterine myoma is among the most common benign gynecologic tumors. Although several nonsurgical treatment options are available, surgical intervention remains the standard approach for managing symptomatic cases.¹ Myomectomy is frequently performed in women who wish to preserve fertility. Since the introduction of laparoscopic myomectomy, advancements in surgical techniques and a growing preference for minimally invasive procedures have shifted the standard approach from laparotomy to laparoscopy. Compared to laparotomy, laparoscopy offers several benefits, including reduced postoperative pain, shorter recovery time, decreased hospital stay, and avoidance of large abdominal scars. Although several nonsurgical treatment options—such as hormonal therapy, uterine artery embolization, and magnetic resonance-guided focused ultrasound—are available and can effectively manage symptoms in selected patients, surgical intervention remains the definitive treatment for many symptomatic cases, particularly when fertility preservation is a priority.¹

Myomectomy, is frequently performed in women who wish to maintain or improve their reproductive potential. Since its introduction, laparoscopic myomectomy has become increasingly favoured laparotomy, largely due to advances in minimally invasive surgical techniques, improvements in instrumentation, and the growing expertise of gynecologic surgeons.

Compared to laparotomy, laparoscopic myomectomy offers several important benefits, including reduced postoperative pain, shorter recovery time, decreased hospital stay, lower risk of postoperative adhesions, and superior cosmetic outcomes due to smaller incisions and avoidance of large abdominal scars. Furthermore, patients undergoing laparoscopic procedures often experience a quicker return

to daily activities and work, contributing to improved overall patient satisfaction.

Specific challenges are faced in laparoscopic myomectomy, such as difficulty in applying adequate traction to the myoma, the technical complexity of suturing the uterine defect following enucleation, potential complications in future pregnancies, and the loss of tactile feedback during surgery.^{1,2}

Women with symptomatic intramural or subserosal leiomyomas who desire future childbearing are good candidates for laparoscopic myomectomy. The International Federation of Gynecology and Obstetrics (FIGO) classification system is a useful tool for determining the appropriate surgical approach based on fibroid location.³ According to this system, uterine leiomyomas are categorized as submucosal (types 0–2), intramural (types 3–5), and subserosal (types 6–7).⁴ While there are no absolute contraindications, all fibroids except those classified as types 0–2 may be suitable for laparoscopic removal, depending on additional clinical considerations

Evaluation of patients with imaging methods is essential for confirming the diagnosis of uterine leiomyomas. Accurate assessment of the size, location, and number of fibroids is crucial for surgical planning and mapping. Additionally, imaging helps identify any coexisting lesions in the uterus or ovaries.

Transvaginal ultrasound is the preferred initial imaging modality due to its high sensitivity and specificity in detecting uterine leiomyomas. In virginal patients, transabdominal ultrasound serves as an alternative. Among available techniques, ultrasound remains the most effective and accessible diagnostic tool for evaluating uterine leiomyomas.⁵

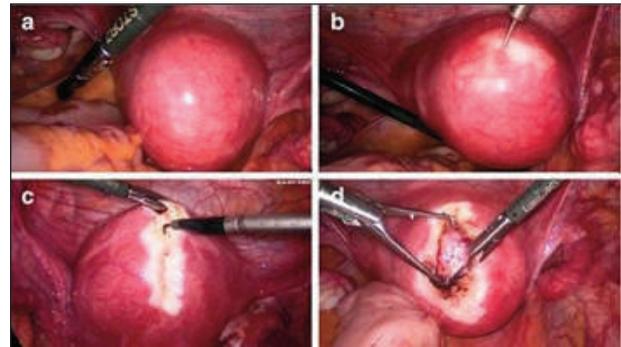
Laparoscopic myomectomy can be performed using one, two, or three ports. However, single-port laparoscopy is often associated with prolonged operative time. The choice of port

number significantly influences the surgical approach to the myoma, particularly in terms of traction, manipulation, enucleation, suturing, and morcellation. Intramyometrial injection of vasoconstrictive agents such as vasopressin can effectively reduce intraoperative bleeding, though these agents carry a risk of severe complications. Hemostatic agents like fibrin glue may also be employed to control bleeding by promoting clot formation. In addition to pharmacological measures, strategies such as ensuring optimal visualization of the surgical field, employing meticulous surgical technique, and minimizing tissue trauma are essential to reduce blood loss. Some degree of bleeding is expected during any surgical procedure, underscoring the importance of experienced surgical personnel to manage potential complications. Traction and countertraction should be applied using a tenaculum to provide blunt and sharp dissection and to separate the plane between the myometrium and myoma. Assistant plays an important role in countertraction for myoma separation, and one needs to be cautious while handling the sharp instruments to prevent injury to adjacent structures. Bleeding from the myometrial defect can be controlled using bipolar energy or sutures.

Suturing remains the most critical factor in uterine wall repair, even when adjunct methods such as uterine artery ligation, vasoconstrictor agents are used. The number of ports and the type of suture material used are closely related. With advancements in instruments and suture technology, surgeons aim to reduce the number of abdominal incisions without increasing operative time. For instance, barbed sutures are often chosen.⁶

Specific incision types are recommended to facilitate suturing: sagittal incisions for posterior fibroids, oblique for anterior nodules, and transverse or elliptical incisions to preserve myometrial tissue. Sutures may be placed in a single layer when the incision allows full-thickness closure. In deeper incisions or cases involving cavity entry, multilayer suturing is required. Surgeons may opt for separate or continuous sutures based on individual case requirements. Both intracorporeal and extracorporeal knots can be used, provided tension is maintained. Preformed disposable endoscopic loops can be used when progressive tying is needed. Following successful enucleation, tying the endloop provides mechanical hemostasis and enhances visualization of the cleavage plane. Studies have shown that this technique reduces diathermy use, improving scar quality.

Innovative suturing techniques have been proposed to enhance outcomes. The “bottom-up suture” technique involves elevating the myoma bed while it remains at-



tached to the uterus, aiding in hemostasis and minimizing dead-space formation. Alternatively, the “baseball” suture technique offers advantages such as reduced suturing time, ease of execution, single-layer closure, decreased dead-space formation, and complete incision sealing. In this approach, the needle is first inserted at the base of the incision on both sides, resulting in a stitch pattern resembling a baseball seam.

Barbed sutures are widely utilized due to their ability to maintain consistent tension without requiring knots. This feature is especially beneficial in laparoscopic myomectomy, where studies have demonstrated reduced uterine repair time, less hemoglobin drop, and decreased blood loss compared to conventional sutures. The barbs on the filament distribute tension evenly, preventing tissue tearing or knot-related lacerations.⁷

Despite these advantages, intraoperative blood loss during laparoscopic myomectomy remains a significant concern. Effective hemostasis depends not only on the suture material and technique but also on the surgeon’s experience, type of fibroid incision, number and size of nodules, and prior treatments aimed at reducing uterine bleeding. One noted drawback of barbed sutures is an increased risk of postoperative adhesions.

Preservation of fertility remains a central goal of laparoscopic myomectomy. When assessing the benefits and risks of the procedure, reproductive outcomes must be considered. Uterine rupture and abnormal placentation are among the most serious complications. Therefore, meticulous suturing is essential to prevent these events. The key factors in uterine repair are the suturing technique and the number of layers used, which depend on the depth of the fibroid and the ex-

tent of the myometrial incision.

The extraction of enucleated myomas has recently become a significant clinical concern. Myomas may be removed from the peritoneal cavity either through colpotomy or via one of the laparoscopic port sites. Some surgeons favor the vaginal route, as even large myomas can often be effectively removed through a posterior colpotomy followed by vaginal morcellation. Transvaginal morcellation offers several advantages, including the avoidance of costly equipment such as electronic morcellators and the elimination of large abdominal incisions. However, this approach also presents certain limitations. These include the need for an additional incision in a potentially contaminated area, the requirement for a second surgical route, and the possible risk of postoperative dyspareunia.

The introduction of morcellators has significantly simplified this process. As the myoma is progressively morcellated and the uterine volume reduced, additional space is created, allowing for improved instrument maneuverability. The 12 or 15 mm claw forceps used with the morcellator provide a superior grip and consistent traction, which greatly shortens operating time and minimizes procedural difficulty. A substantial amount of tissue must be securely grasped to extract the myomas in longer fragments, thereby reducing morcellation time. It is essential to maintain an accurate count of the myomas and to carefully document their location within the abdominal cavity to prevent inadvertent loss or misplacement.

The use of 12- to 15-mm and morcellator trocars increases the risk of herniation through the internal fascial sheath; therefore, this layer should be closed separately to prevent such complications. We employ a suture passer needle to facilitate fascial closure under laparoscopic guidance. The needle is inserted through one edge of the internal fascia, and the primary surgeon uses a needle driver to grasp the free end of the intra-abdominal suture. The suture passer is then withdrawn and reinserted through the opposite edge of the fascia. The free suture end is passed into the needle passer and extracted. A simple knot is tied to secure the closure; alternatively, a figure-of-eight suture may be placed if a fascial defect remains. The skin and all remaining incisions are closed in the standard fashion.⁸ Laparoscopic Myomectomy is a safe and favorable alternative to open Myomectomy as it offers several advantages over laparotomy with minimal complications. It is equally feasible for even large size myomas in experienced hands with advance suturing skills. Multi-

layer closure of the myoma bed in continuous, non-locking fashion gives excellent reproductive outcomes in terms of very low adhesion scores and negligible risk of scar rupture in subsequent pregnancies. However, one should appropriately select the myoma size according to one's suturing skills, instruments available and experience.

REFERENCES.....

1. Fukuda M, Tanaka T, Kamada M, Hayashi A, Yamashita Y, Terai Y, Ohmichi M. Comparison of the perinatal outcomes after laparoscopic myomectomy versus abdominal myomectomy. *Gynecologic and obstetric investigation*. 2013 Oct 1;76(4):203-8.
2. Pritts EA, Parker WH, Olive DL: Fibroids and infertility: an updated systematic review of the evidence. *Fertil Steril* 2009;91:1215-1223.
3. Munro MG, Critchley HO, Fraser IS, et al. The FIGO classification of causes of abnormal uterine bleeding in the reproductive years. *Fertil Steril* 2011;95:2204-8, 2208.e1-3.
4. Munro MG, Critchley HOD, Fraser IS, et al. Corrigendum to "The two FIGO systems for normal and abnormal uterine bleeding symptoms and classification of causes of abnormal uterine bleeding in the reproductive years: 2018 revisions" [*Int J Gynecol Obstet* 143(2018) 393-408.]. *Int J Gynaecol Obstet* 2019;144:237. Erratum for *Int J Gynaecol Obstet* 2018;143:393-408.
5. Dueholm M, Lundorf E, Hansen ES, et al. Accuracy of magnetic resonance imaging and transvaginal ultrasonography in the diagnosis, mapping, and measurement of uterine myomas. *Am J Obstet Gynecol* 2002;186:409-15.
6. Fernandes RP, Fin F, Magalhães R, et al. Stepwise Laparoscopic Myomectomy and the Baseball Closure. *J Minim Invasive Gynecol* 2021;28:1278-9.
7. Paul PG, Mehta S, Annal A, et al. Reproductive Outcomes after Laparoscopic Myomectomy: Conventional versus Barbed Suture. *J Minim Invasive Gynecol* 2022;29:77-84
8. Dumitraşcu MC, Nenciu CG, Nenciu AE, Călinoiu A, Neacşu A, Cîrstoiu M, Şandru F. Laparoscopic myomectomy - The importance of surgical techniques. *Front Med (Lausanne)*. 2023 Mar 20;10:1158264. doi: 10.3389/fmed.2023.1158264. Erratum in: *Front Med (Lausanne)*. 2023 Aug 21;10:1251421. doi: 10.3389/fmed.2023.1251421. PMID: 37020679; PMCID: PMC10067888.



Dr Deven Jogal
MBBS, DGO, FMAS

Total Laparoscopic Hysterectomy (TLH) Surgery Procedure

Introduction -

Total Laparoscopic Hysterectomy (TLH) is a minimally invasive surgery where the uterus is removed through small incisions made in the abdomen. The most frequently performed major surgical procedure in gynaecology for benign and malignant indications is hysterectomy^[1]. Indications mainly include leiomyomas causing abnormal uterine bleeding (40%), endometriosis/adenomyosis causing dysmenorrhea, dyspareunia, abnormal uterine bleeding (18%) and pelvic organ prolapse^[3]

Medical management can be tried considering various factors like age, fertility preservation, patient's choice, however surgery often remains the definite treatment.

The aim of this article is to provide better insights and tips and tricks for the surgical steps of laparoscopic hysterectomy.

What is done in operation theatre?

The key factors to ensure that the surgical procedure can be performed uneventfully is a well-equipped operation theatre with appropriate positioning of the laparoscopic set up and surgeons.^[2]

• Patient positioning:

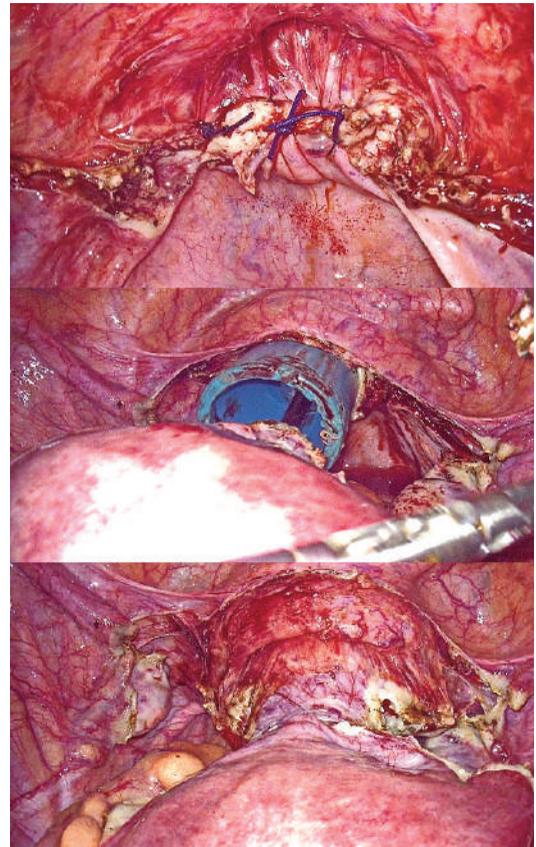
Lithotomy position with legs spread apart in little ventral flexion is most used position. In cases where a pronounced Trendelenburg position is required shoulder braces must be used.

• surgical team organisation:

A right-handed surgeon will normally work from the left side of the patient. Then, the first assistant will be placed on the right side and the second assistant will be placed on the vaginal end.

• Abdominal access: Pneumoperitoneum creation

In the case of the Veress needle, the CO₂ gas is turned on and the monitor should be checked for readings of pressure and flow. The intra-abdominal pressure should be <15



mm and should be declining if the position of Veress needle is correct.

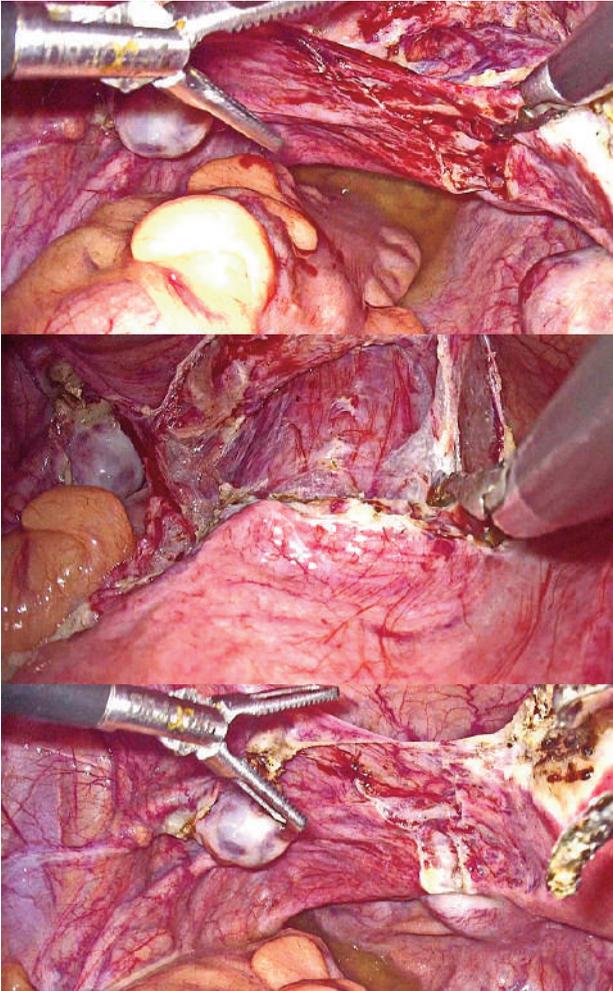
- Inspection of the abdominal cavity
 - o After creating pneumoperitoneum (12-15 mmHg), entrance placement is checked for possible intestinal, vascular injuries or pre-pneumoperitoneum.

- o All four quadrants of the abdominal cavity are examined, including under the liver and diaphragm.

Then, Trendelenburg position is given so that the small bowel can be displaced completely out of the pelvis.

The table height is kept as low as possible for the required comfort of the surgeon. Often platforms are used by the surgical team if the required ergonomics is not achieved.

• Accessory Trocar insertion



o Reference points are often defined as midpoint between anterior superior Iliac spine – primary trocar and between pubic symphysis and primary trocar.

o Trocar placement must be done considering the size and the situation of the structure that is going to be removed.

o to avoid injury the location of the epigastric vessels and the umbilical artery must be checked before trocar insertion.

o Trocar placement must allow free movements of the instrument. The optimal trocar orientation is 90° from the abdominal plane.

o Trocar placement in ergonomic situation will allow an optimal triangulation.

• Inspection of the pelvis

o Pelvis exposure is achieved by mobilisation of the small bowel, sigmoid colon and performing adhesiolysis if required.

o Uterine and adnexa anatomy should be inspected.
o Uterine manipulator insertion should be done without injury to the surrounding structures. The uterine manipulator must be placed deep enough in the uterine cavity to allow maximum uterus mobility.

o The pouch of Douglas and ovarian fossa should be checked.

o Checking ureters: the course of ureter must be checked. It is advisable to divide the congenital adhesions between the sigmoid colon and the lateral pelvic wall, to facilitate the exposure of both the left ureter and the infundibulopelvic ligament.

o The uterine manipulator is pushed cranially, lateral to the opposite side of the dissection in an intermediate position

• Surgery begins in the cornual region.

a. Round ligament

a. Fallopian tube

b. Ovarian ligament

• All these structures need to be coagulated and cut. Fallopian tube is held with bowel grasper and traction is given. Salpingectomy is done taking care of meso-salpingeal vessels. This is followed by Coagulation and dissection of the ovarian ligament and then followed by coagulation and dissection of the round ligament and followed by direct coagulation of the utero-ovarian anastomosis.

• In the case of leaving the ovaries in situ, opportunistic salpingectomy is done.

Division of both folds of the broad ligament - This action will allow CO2 entrance into the retroperitoneal space and help to separate the anterior and posterior fold of the broad ligament

– closer to the pelvic sidewall (preferred option if a complete dissection of the pelvic sidewall is planned)

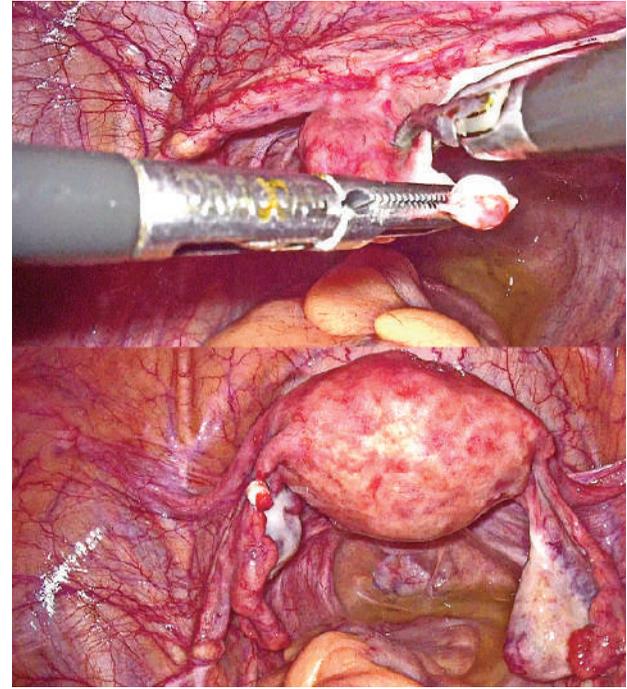
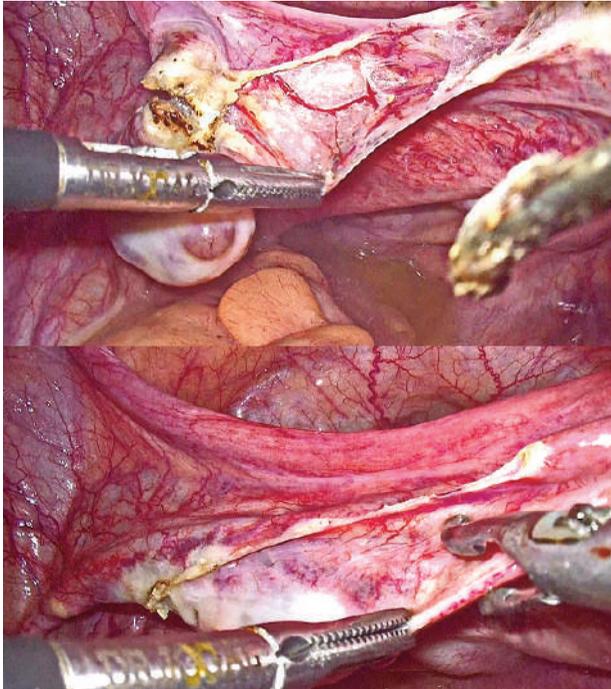
– closer to the uterus (preferred option if the pelvic sidewall will not be entered).

• In case where ovaries are to be removed – IP ligament is coagulated and cut

✓ It should be performed without damaging the surrounding tissues.

✓ There is high risk of bleeding from venous IP-vessels.

✓ Checking if the ureter is far from the dissection area. A good way of identifying the ureter is to look for it at the point where the iliac arteries bifurcate, since the ureter crosses the lateral to the medial.



- ✓ Coagulation of IP ligament.
- ✓ It must be performed with an adequate energy source or suture.
- ✓ Insufficient coagulation of infundibulopelvic ligament (i.e. of ovarian vessels) should be avoided at all cost: the bleeding vessels will retract into the retroperitoneum, requiring a major retroperitoneal dissection for secondary haemostasis – at very high risk for ureteric lesion.

• **Dissection of the posterior leaf of the broad ligament:**

- o The posterior peritoneum is dissected and cut towards the utero-sacral ligaments.
- o In cases of grade 4 endometriosis ureterolysis should be done at the beginning of surgery preferably till ureteric tunnel

• **Dissection of the vesico-uterine space**

The vesico-uterine junction is identified as a white line firmly attached to the uterus, around 2-3 cm between the bladder and the uterus. The initial incision must be performed caudal to the white line. It is recommended to open only the pre-vesical peritoneum. This helps to avoid vesical damage.

• **Opening of the vesico-uterine space:**

- o In anatomically easy cases, this can be performed in the midline until the cervical margin is exposed.
- o In anatomically difficult cases (after previous surgery) a lateral approach is usually recommended.

- o The surgeon identifies the vesico-vaginal space and dissects this space in caudal direction with dissection and superficial coagulation, without damaging the bladder. Also, since fat belongs to the bladder, it is recommended to stay below the fat to avoid bladder injuries. Bladder pillars must be coagulated and cut on both sides.

• **Skeletonization of the uterine vessels:**

- o The margins ascending portion of the uterine artery is freed from surrounding structures
- o Ureter must be identified before coagulation and resection of uterine artery.

The paracervical attachments - mackenrodt ligament are coagulated and cut. A transverse incision is made through the fascia slightly below the level of internal os and the fascia is freely dissected with a probe.

• **Colpotomy:**

An appropriate energy source was used for circumferential colpotomy. The colpotomizer must be placed in the same direction as the incision that helps the opening of the vagina by using energy source.

• **Uterus retrieval:**

Specimens are retrieved vaginally. Lateral coring technique is often used if the size of the uterus is huge. The vagina is then occluded to restore pneumoperitoneum.

• **Vaginal closure:**

The vaginal vault is sutured with interrupted or continuous sutures, laparoscopically. A randomized trial has given evidence that closing the vaginal vault vaginally increases vault dehiscence and wound complications^[4]. Vaginal suturing includes sufficient width of vaginal mucosa and fascia. The suture includes both utero-sacral ligaments for pelvic support without undue traction. (can cause ureteral kinking)^[5]

• **Haemostasis and inspection:**

The pelvis should be irrigated and aspirated (intra-abdominal pressure reduced to e.g. 2-4 mmHg). High CO2 pressure causes pressure on bleeding vessels and can give a fake reassurance of haemostasis. Therefore, haemostasis should be checked at low flow CO2. Vascular pedicles, vaginal vault, ureters, and bladder should be checked. The surrounding structures should be checked for no damages.

• **Trocar removal and skin suturing:**

Trocar removal under direct vision and examining haemostasis.

Totally evacuating pneumoperitoneum.

Suture fascia of trocars ≥ 10 mm.

Considering a local subcutaneous anaesthesia for the reduction of postoperative pain.

• **Closing skin incisions.**

• **Conclusion -**

Laparoscopic hysterectomy is associated with proven benefits. It can be considered as a preferable alternative to abdominal or vaginal hysterectomy. Laparoscopic surgery has been adopted by gynaecologic surgical specialists as an effective surgical approach for the removal of the uterus. The standardisation of the surgical technique, the clinical and practical guidelines, and the detailed description of the surgical steps of LH are intended to make this approach safe and to ensure a favourable outcome for all patients.

.....
References –

- 1.Aarts J, Nieboer T, Johnson N, et al. Surgical approach to hysterectomy for benign gynaecological disease. Cochrane Database Syst Rev. 2015;12:Art No CD003677. doi: 10.1002/14651858.CD003677. [DOI] [PMC free article] [PubMed] [Google Scholar]
- 2.Reich H. Total laparoscopic hysterectomy: indications, techniques and outcomes. Cur Opin Obstet

Gynecol. 2007;19(4):337–344. doi:

10.1097/GCO.0b013e328216f99a. [DOI] [PubMed] [Google Scholar]

- 3. The American College of Obstetricians and Gynecologists (ACOG) Choosing the route of hysterectomy for benign disease: Committee opinion. 2017. No 701; 129:e 155-9

- 4.Uccella S, Malzoni M, Cromi A, et al. Laparoscopic vs transvaginal cuff closure after total laparoscopic hysterectomy: a randomized trial by the Italian Society of Gynecologic Endoscopy. AJOG.

2018;218(5):500.e1-13. doi:

10.1016/j.ajog.2018.01.029. [DOI] [PubMed] [Google Scholar]

- 5.Richter LA, Boileau J, Janni M, Tefera E, Iglesia CB. Intraoperative Ureteral Kinking During Uterosacral Ligament Suspension: Effect of Training Level on Occurrence. J Reprod Med. 2016 Jan-Feb;61(1-2):17-21. PMID: 26995883.



Dr Manish Machave
President POGS
Senior obstetrician,
Gynecologist and lapa-
roscopic surgeon Ruby
Hall Clinic and
Machave hospital.

Laparoscopic Radical Hysterectomy with Pelvic Lymphadenectomy- when and how?

"Cancer must not be touched unless it can be completely eradicated". Herman Boerhaave
Historical perspective-

Clark performed the first radical hysterectomy for cervical cancer at Johns Hopkins Hospital in 1895. In 1898, Wertheim, a Viennese physician, developed the radical total hysterectomy with removal of the pelvic lymph nodes and the parametrium. In 1905, Wertheim reported the outcomes of his first 270 patients. The operative mortality rate was 18%, and the major morbidity rate was 31%.

In 1901, Schauta described the radical vaginal hysterectomy and reported a lower operative mortality rate than the abdominal approach. In the late 20th century, radiation therapy became the favored approach because of the high mortality and morbidity of the surgical approach.

In 1944, Meigs repopularized the surgical approach when he developed a modified Wertheim operation with removal of all pelvic nodes (the Wertheim-Clark plus Taussig operation). Meigs reported a survival rate of 75% for patients with stage I disease and demonstrated an operative mortality rate of 1% when these procedures were performed by a specially trained gynecologist. Throughout the remainder of the 20th century, various modifications have been made for this radical procedure, especially in light of improvements in the areas of anesthesia, intensive care, antibiotics, and blood product transfusion science. Kobayashi developed Nerve sparing radical hysterectomy in 1961.

Advent of Laparoscopic Radical Hysterectomy-

With advances in video-assisted laparoscopy, numerous advantages of minimal access over open surgery were particularly desirable in a high morbidity surgery like radical hysterec-

tomy. Dargent (1987) used laparoscopy for pre-surgical evaluation followed by Shauta's radical vaginal hysterectomy. Querleu (1991) introduced laparoscopic pelvic lymph node dissection for early cervical cancer. Nezhat(1992) performed the first lap radical hysterectomy with pelvic and paraaortic lymphadenectomy. GOG Lap 2 Trial (2009) concluded the non-inferiority of lap vs open surgery for endometrial cancer.

LACC Trial 2018: MIS vs. Open surgery showed poorer disease free and overall survival in MIS group (91.2 % vs 97.1%, 93.8 vs 99%)

Types and routes-

'Class' of Radical hysterectomy Piver, Rutledge & Smith (1975)

'Types' of Radical Hysterectomy Querleu & Morrow (2008, 2011, 2017)

• Open • Vaginal • Laparoscopy • Robotic
Querleu & Morrow's Classification(2008) & Update (2011, 2017)-What changed???

1. 'Class' replaced by 'Type', numbers by letters
2. Extent of parametrial resection is key parameter between types of hysterectomy
3. Previous terminology changed
4. Anatomical landmarks to classify parametrial extent
5. Includes nerve-sparing hysterectomy
6. Lymph nodes are dealt with separately

Terminology & Landmarks –

1. Parametrium re-introduced, in original Q&M was called 'paracervix'. Ventral parametrium (vesico-uterine and vesico-vaginal ligaments), lateral parametrium (paracervix) and dorsal parametrium (recto-uterine and recto-vaginal ligaments). Ventral parametrium divided into 2 parts by ureter cranial (above ureter) and caudal below Ureter.

2. Two spaces described dorsally: sacro- uterine space(medial para-rectal space) between rectum and dorsal parametrium and pararectal

fossa(pararectal space) between dorsal parametrium and iliac vessels.

3. Deep uterine vein (vaginal vein) important landmark in lateral parametrium: 1-2 cm from below uterine artery and vein

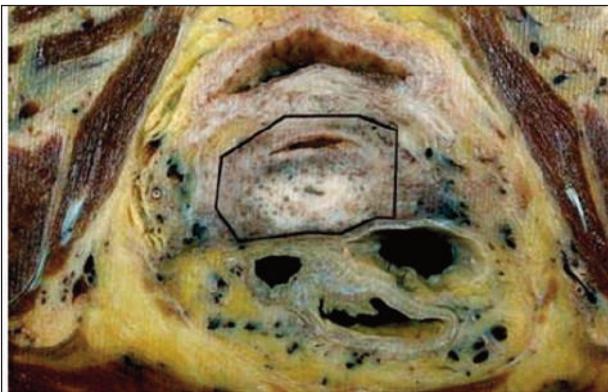
Type of QnM Radical hysterectomy, technique and indication-

Type A : Minimum resection of paracervix, Limited radical hysterectomy.

- Visualization after opening ureteric tunnel (abdominal or lap surgery) or palpation of the ureters without dissection of the ureteral bed (radical vaginal hysterectomy)
- Paracervix transected medial to ureter but lateral to cervix
- Uterine artery, uterosacral ligament and cardinal ligament are not transected at a distance from the uterus.
- Minimal vaginal cuff removed (<10mm)

Indication -1. Microinvasive cancer Stage IA2 and Stage IB1 < 2cm with negative nodes, no lymphovascular space invasion

2. completion surgery after chemo/radiotherapy.



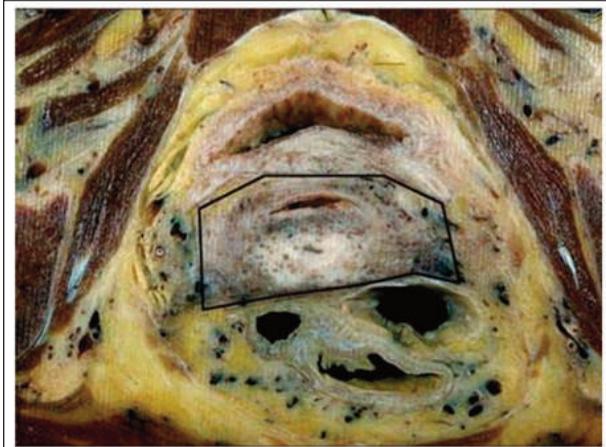
Extent of Type A Radical hysterectomy. Figure

Type B Hysterectomy: Resection of paracervix at the ureter

- Ureters are unroofed and rolled laterally.
- Partial resection of uterosacral peritoneal fold of rectouterine ligament and vesicouterine ligaments.
- Vesicovaginal ligament not transected
- Transection of the paracervix at the level of the ureteric tunnel.
- At least 10 mm of the vagina from the cervix or tumor is resected.

Type B1: Without removal of lateral paracervical lymph nodes.

Type B2: With additional removal of lateral paracervical lymph nodes



Extent of Type B Radical hysterectomy. Figure -

Type C Hysterectomy

- Ureters are completely mobilized.
- Transection of the uterosacral ligament at the rectum.
- Transection of the vesicouterine ligament at the bladder.
- Complete transection of the paracervix.
- 15–20 mm of the vagina from the cervix or tumor and the corresponding paracolpos is resected routinely.

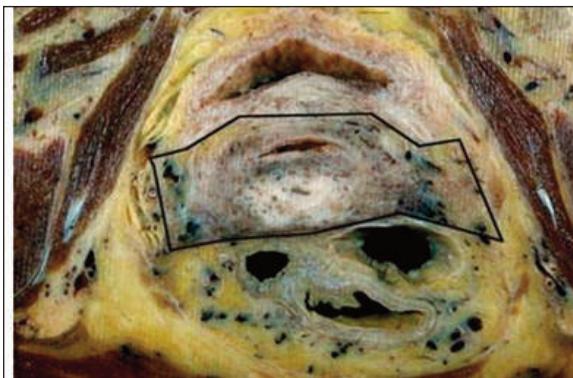
Type C1: With preservation of autonomic nerves

Type C2: Without preservation of autonomic nerves

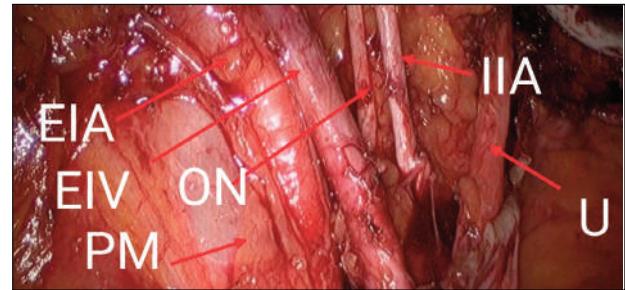
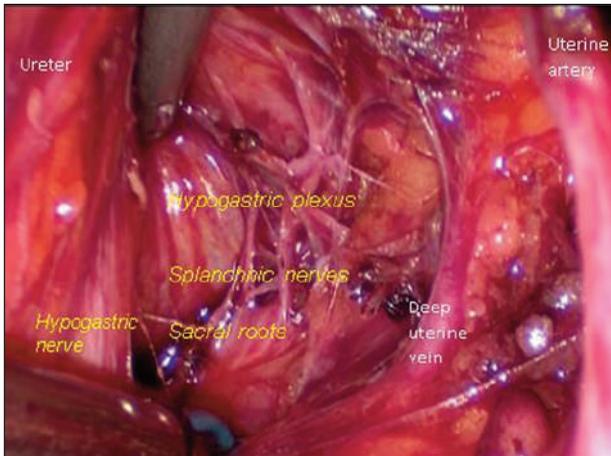
C1 hysterectomy- associated with faster recovery of bladder function and lesser degree of bowel dysfunction.

Sympathetic fibres (Superior hypogastric plexus and 2 hypogastric nerves): Bladder compliance, urinary continence and small muscle contractions at orgasm.

Parasympathetic fibres (Pelvic splanchnic nerve – S2,3,4) : detrusor contractility, vaginal swelling and lubrication during sexual arousal



Extent of Type C Radical hysterectomy. Figure -



Type D Hysterectomy

Type D1: resection of the entire paracervix at the pelvic side wall together with the hypogastric vessels, exposing the roots of the sciatic nerve. Corresponds to Palfalvi- Ungar laterally extended parametrectomy (stage IIB tumors)

Type D2: type D1 plus resection of the entire paracervix with the hypogastric vessels and adjacent fascial or muscular structures (LEER– Laterally extended endo-pelvic resection described by Hockel)

Lymphadenectomy-

Boundaries of Pelvic Lymphadenectomy-

Lateral: genitofemoral nerve

Medial: internal iliac artery

Inferior: deep circumflex iliac vein

Superior: bifurcation of common iliac artery

Levels of Lymphadenectomy-

Lymphadenectomy is described separately according to four levels and radicality (sentinel node sampling, random sampling, removal of enlarged nodes only, systematic lymph node dissection or debulking)

- Level 1—External and internal iliac
- Level 2—Common iliac (including presacral)
- Level 3—Aortic inframesenteric
- Level 4—Aortic infrarenal

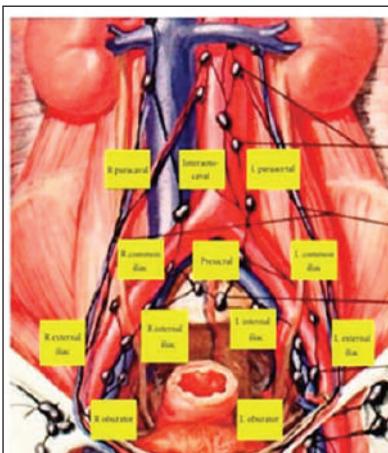
and high-risk groups have been defined pathologically. The GOG surgical manual describes comprehensive surgical staging of endometrial cancer as removal of the uterus, cervix, adnexa, and pelvic and para-aortic lymph node tissues, and obtaining pelvic washings. GOG defines pelvic lymphadenectomy as removal of the nodal tissue from the distal half of the common iliac arteries, the anterior and medial aspect of the proximal half of the external iliac artery and vein, and the distal half of the obturator fat pad anterior to the obturator nerve; para-aortic lymph node dissection is described as removal of nodal tissue over the distal inferior vena cava from the level of the inferior mesenteric artery to the mid right common iliac artery and removal of the nodal tissue between the aorta and left ureter from the mid inferior mesenteric artery to the mid left common iliac artery.

Operative Report of Radical Hysterectomy -must include-

- a. All parts of definition of Type of Hysterectomy
- b. Mode of management of uterine artery
- c. Surgical and pathological length of ventral, dorsal & lateral parametrium
- d. Surgical and pathological length of vagina removed
- e. Approach or route of hysterectomy/ lymph node dissection
- f. Use of preoperative radiotherapy, brachytherapy, chemotherapy or combinations

References-

1. 2017 Update on the Querlow-Morrow classification of radical Hysterectomy; Gynaecologic Oncology 122 (2011); 264-268.
2. The history of radical hysterectomy; Polat Dursun, MD, Murat Gultekin, MD, and Ali Ayhan, Professor Department of Obstetrics & Gynecology, Baskent University School of Medicine, Ankara, Turkey.
3. Comprehensive Surgical Staging for Endometrial Cancer
Bunja Rungruang , Alexander B Olawaiye ; Rev Obstet Gynecol. 2012;5(1):28–34.



Comprehensive Surgical Staging for Endometrial Cancer

Despite a shift from clinical to surgical staging of endometrial cancer in 1988, performance of comprehensive surgical staging for clinically early-stage endometrial cancer remains controversial. Low-, intermediate-,



Dr Mahindra Borse
Laparoscopic Gynaecological Surgeon,
Robotic Surgeon, IVF
Consultant, Pune

Laparoscopic Management of Adnexal Masses: A Comprehensive Review

Abstract

Adnexal masses encompass a spectrum of gynecological conditions, ranging from benign cysts to malignant tumors. The advent of laparoscopy has revolutionized their management, offering benefits such as reduced postoperative pain, shorter hospital stays, and quicker recovery. This article delves into the indications, techniques, outcomes, and considerations associated with laparoscopic management of adnexal masses.

Introduction

Adnexal masses refer to growths that occur near the uterus, often involving the ovaries, fallopian tubes, or surrounding connective tissues. They are commonly detected during routine pelvic examinations or imaging studies. While many are benign and asymptomatic, others may present with pain, bloating, or menstrual irregularities.

Indications for Laparoscopic Management Laparoscopy is indicated for:

- Diagnostic Evaluation: To determine the nature of the mass.
 - Therapeutic Intervention: For removal of benign masses, cysts, or endometriomas.
 - Staging and Treatment: In selected cases of early-stage malignancies.
- However, certain conditions may necessitate open surgery, such as:
- Large Masses: Where laparoscopic removal is challenging.
 - Suspicion of Malignancy: Especially when intraoperative rupture could upstage cancer.
 - Extensive Adhesions: Making laparoscopic access difficult.

Preoperative Assessment

Clinical Evaluation

History

- Age and Menopausal Status: Risk of malignancy increases significantly after menopause.
- Symptoms: Abdominal pain, bloating, early satiety, and weight loss may suggest malignancy.

nancy.

- Menstrual and Obstetric History: Endometriomas are more common in reproductive-age women.
 - Family History: BRCA mutation carriers are at higher risk for ovarian cancer.
- #### Physical Examination
- Pelvic Examination: Assess for size, mobility, consistency, and bilateral nature.
 - Abdominal Examination: Look for signs of ascites, masses, or organomegaly.

Imaging Evaluation

Transvaginal Ultrasonography (TVUS)

- First-line imaging for adnexal masses.
- **Features Suggestive of Benign Masses:**
 - Unilocular, anechoic cyst
 - Thin, smooth walls
 - No solid areas or septations
- **Features Suggestive of Malignancy:**
 - Solid components
 - Papillary projections
 - Thick septa
 - Bilaterality
 - Ascites

IOTA Simple Rules & ADNEX Model

- Widely validated scoring system to differentiate benign and malignant masses.
- Combines morphology with patient factors (e.g., age, CA-125).

Risk of Malignancy Index (RMI)

- Combines CA-125 level, menopausal status, and ultrasound findings.
- $RMI = U \times M \times CA-125$
 - U = Ultrasound score (0, 1, or 3)
 - M = Menopausal status (1 or 3)
 - A score >200 suggests high risk of malignancy.

MRI/CT Scan

- MRI: Best second-line tool for indeterminate masses, particularly endometriomas or dermoid cysts.
- CT Scan: Reserved for suspected malignancy with staging purpose.

Serum Biomarkers

CA-125

- Elevated in ~80% of epithelial ovarian cancers, but also in benign conditions (endometriosis, fibroids, PID).
- Less reliable in premenopausal women due to low specificity.

HE4 (Human Epididymis Protein 4)

- Higher specificity than CA-125, especially in distinguishing endometriosis from malignancy.

$$PI = -12.0 + 2.38 \times LN(HE4) + 0.0626 \times LN(CA125)$$

Postmenopausal Women:

$$PI = -8.09 + 1.04 \times LN(HE4) + 0.732 \times LN(CA125)$$

III. ROMA Score Calculation

$$ROMA (\%) = [\exp(PI) / (1 + \exp(PI))] \times 100$$

IV. ROMA Risk Classification Thresholds

Menopausal Status	ROMA Score < Threshold	ROMA Score ≥ Threshold
Premenopausal	Low Risk (< 13.1%)	High Risk (≥ 13.1%)
Postmenopausal	Low Risk (< 27.7%)	High Risk (≥ 27.7%)

ROMA (Risk of Ovarian Malignancy Algorithm)

Purpose:

The ROMA classification is used to assess the risk of epithelial ovarian cancer in women presenting with a pelvic mass. It combines serum biomarkers HE4 and CA125 with menopausal status to stratify patients into high or low risk categories.

I. Required Inputs

- Serum HE4 (Human Epididymis Protein 4) level
- Serum CA125 (Cancer Antigen 125) level
- Menopausal status (Premenopausal or Postmenopausal)

II. Calculation of Predictive Index (PI)

Premenopausal Women:

V. Clinical Interpretation of ROMA

- Low Risk: Suggests a low probability of epithelial ovarian cancer.
- High Risk: Suggests a high probability; referral to a gynecologic oncologist is recommended.

Other Markers (selectively used):

- AFP, β-hCG, LDH: In younger women to evaluate for germ cell tumors.

- Inhibin A/B, estradiol: For sex cord-stromal tumors.

Other Markers (selectively used):

- AFP, β-hCG, LDH: In younger women to evaluate for germ cell tumors.

- Inhibin A/B, estradiol: For sex cord-stromal tumors.

Risk Level	Assessment Findings	Recommended Management
Low Risk	Simple cysts, unilocular, CA-125 normal, RMI <200	Laparoscopic cystectomy or observation
Intermediate Risk	Complex mass, equivocal markers, moderate RMI	Laparoscopic or open removal
High Risk	Solid mass, papillary projections, ascites, RMI >200, elevated CA-125 and HE4	Staging surgery

Special Considerations

- Pregnancy: Ultrasound is safe; MRI may be used if necessary. Surgery ideally in second trimester.
- Pediatric/Adolescent Patients: Germ cell tumors more common—use AFP, β-hCG, LDH.
- Postmenopausal Women: Any adnexal mass warrants high suspicion; CA-125 and IOTA are more reliable.

Surgical Techniques

1. Port Placement and Access

- Typically, three to four ports are used.
- The umbilical port serves as the primary access point for the laparoscope.

- Additional ports are placed under direct visualization to accommodate instruments.

2. Mass Evaluation

- Visual inspection assesses the size, surface characteristics, and presence of ascites or peritoneal implants.
- Any suspicious findings may necessitate conversion to laparotomy.

3. Cystectomy or Oophorectomy

- Cystectomy: Removal of the cyst while preserving ovarian tissue, preferred in younger women desiring fertility.

- Oophorectomy: Removal of the entire ovary, considered when the ovary is extensively involved or in postmenopausal women.

4. Specimen Retrieval

- Masses are placed in endoscopic retrieval bags to prevent spillage.
- In cases of large masses, controlled aspiration may reduce size for extraction.

Intraoperative Considerations

- Frozen Section Analysis: Immediate pathological evaluation can guide intraoperative decisions.
- Avoiding Rupture: Careful handling minimizes the risk of cyst rupture, which can disseminate malignant cells if present.
- Conversion to Laparotomy: If malignancy is confirmed or complications arise, open surgery ensures comprehensive management.

Postoperative Outcomes

Studies have demonstrated favorable outcomes with laparoscopic management:

- Reduced Hospital Stay: Patients often discharge within 24-48 hours.
- Lower Complication Rates: Minimally invasive techniques result in fewer infections and faster recovery.
- Fertility Preservation: Especially pertinent in reproductive-aged women undergoing cystectomy.

Special Considerations

1. Pregnancy

- Laparoscopy during the second trimester is considered safe.
- Indications include persistent masses, torsion, or suspicion of malignancy.

2. Elderly Patients

- While laparoscopy offers benefits, comorbidities may pose challenges.
- Careful patient selection and perioperative management are essential.

Types of Adnexal Masses and Laparoscopic Management

1. Functional Cysts (Follicular, Corpus Luteum)

- Features: Thin-walled, unilocular, <5 cm
- Surgical Tips: Observation is usually sufficient. If surgery is needed, gentle aspiration and wall excision without coagulation is preferred.

2. Endometriomas

- Challenges: Dense adhesions, high risk of AMH decline due to cortical involvement

• Surgical Tips:

- o Minimize bipolar energy use; avoid deep coagulation
- o Use hydrodissection and cold scissors for cyst wall separation
- o Consider the "stripping technique" only when clear planes are identified
- o Suturing bleeding points rather than coagulating when feasible
- o Avoid complete removal if ovarian tissue is indistinguishable—partial ablation may be considered

3. Dermoid Cysts (Mature Cystic Teratoma)

- Features: Solid and cystic components with sebaceous material and hair

• Surgical Tips:

- o Use endobags to prevent chemical peritonitis from spillage
 - o Remove intact if possible; aspirate thick contents only inside a retrieval bag
 - o Avoid aggressive traction to prevent ovarian rupture
 - o Suture the ovarian defect if large
- ##### 4. Serous and Mucinous Cystadenomas
- Features: Usually benign, unilocular or multilocular
 - Surgical Tips:
 - o Perform controlled cyst aspiration prior to removal if large
 - o Gentle dissection with minimal energy
 - o Avoid excessive traction on the ovarian cortex

5. Paraovarian and Paratubal Cysts

- Features: Thin-walled, located near fallopian tube

• Surgical Tips:

- o Easy enucleation with careful identification of fallopian tube
- o Preserve tubal fimbriae and avoid mesosalpinx vascular injury

6. Borderline Tumors and Early Malignancy

- Considerations: Avoid cyst rupture, use endobag, consider frozen section

• Surgical Tips:

- o No morcellation
- o Frozen section to be considered.
- o Immediate conversion if malignancy is suspected
- o Perform peritoneal washings and biopsies as per oncologic protocols

Techniques to Preserve Ovarian Function and Prevent AMH Decline

1. Minimize Thermal Injury

- Use bipolar coagulation sparingly.
- Prefer suturing over cautery for hemostasis.
- Apply energy only at low settings and for minimal durations.

2. Gentle Tissue Handling

- Avoid crushing or excessive traction on the ovarian cortex.
- Use atraumatic forceps and cold scissors for dissection.

3. Hydrodissection

- Hydrodissection with saline can help separate cyst wall from ovarian tissue with minimal trauma.

4. Use of Hemostatic Agents

- Fibrin glue or oxidized cellulose may be used instead of thermal coagulation in hemostasis.

5. Suturing vs. Coagulation

- Where feasible, close ovarian defects with fine absorbable sutures rather than thermal coagulation.

6. Postoperative Considerations

- Consider post-op hormonal therapy (e.g., OCPs or dienogest) to suppress endometriosis recurrence.
- Counsel patients on AMH monitoring post-surgery, especially if fertility is desired.

Goals of Safe Tissue Retrieval

- Prevent intra-abdominal spillage
- Preserve oncological safety (if malignancy is suspected)
- Minimize trauma to surrounding tissues
- Allow for accurate histopathological diagnosis
- Avoid complications such as peritonitis or infection

Common Tissue Retrieval Techniques

1. Use of Endoscopic Retrieval Bag (Endobag)

- Indications: Standard for all cysts with rupture risk or unclear diagnosis (e.g., dermoids, endometriomas, borderline tumors).

• Technique:

- o Insert through a 10–12 mm port
- o Specimen placed into the bag inside the abdomen
- o Bag is closed and exteriorized through the port or via a small extension

• Advantages:

- o Prevents spillage
- o Maintains integrity of specimen

• Tips:

- o Use larger bags (e.g., 10×15 cm) for dermoids and large cysts
- o Partially aspirate contents within bag for easier extraction

2. Controlled Cyst Aspiration Within the Bag

- Indications: Large benign cysts (e.g., serous cystadenomas) that cannot be removed intact

• Technique:

- o Place cyst in endobag
- o Aspirate contents using needle or suction device while still sealed in the bag

• Cautions:

- o Always aspirate within the bag to prevent contamination
- o Ensure negative pressure doesn't collapse the bag and allow leakage

3. Transumbilical Extraction

- Indications: Small or moderate-size specimens

• Technique:

- o Use umbilical port for specimen delivery
- o Extend incision slightly if needed (~1.5–2 cm)
- o Bag-assisted extraction recommended

• Advantages:

- o Minimizes new incisions
- o Good cosmetic outcome

4. Posterior Colpotomy (Vaginal Extraction)

- Indications: Virgin abdomen, large benign masses, when vaginal access is feasible

• Technique:

- o Posterior fornix opened transvaginally under laparoscopic guidance
- o Bag-delivered specimen removed via posterior colpotomy

• Advantages:

- o Avoids abdominal wall trauma

• Cautions:

- o Not ideal in patients with vaginal stenosis or active infection

- o Vaginal cuff closure needed post-retrieval

5. Mini-laparotomy (Suprapubic or Umbilical)

- Indications: Very large masses, highly suspicious for malignancy, failed laparoscopic retrieval

• Technique:

- o Small (~3–5 cm) incision made
- o Specimen removed intact

• Advantages:

- o Preserves oncologic principles in suspected malignancy

• Drawbacks:

- o Increased morbidity compared to laparoscopy
- o Requires wound closure and extended recovery

6. Morcellation

- Manual or Electromechanical

- Indications: Solid benign masses, fibroids

- Contraindications: Suspected malignancy or dermoids

• Risks:

- o Tissue fragmentation can seed the peritoneum
- o FDA has issued warnings against morcellation in cases with undiagnosed uterine sarcomas

• Safety Tips:

- o Use contained morcellation systems
- o Avoid morcellation in adnexal masses of unknown nature

Specimen-Specific Considerations

Mass Type	Preferred Retrieval Technique	Notes
Dermoid cyst	Endobag + controlled aspiration	Prevent chemical peritonitis
Endometrioma	Bag + intact excision preferred	Minimize endometriosis spread
Serous/Mucinous cystadenoma	Aspiration within bag	Avoid mucinous spillage
Suspicious mass / borderline tumor	Intact in bag or mini-laparotomy	Never morcellate
Germ cell tumor (benign)	Bag-assisted transumbilical or colpotomy	Often large but benign

Conclusion

Laparoscopic management of adnexal masses is a safe, effective, and minimally invasive approach that offers numerous advantages over traditional laparotomy, including reduced postoperative pain, shorter hospital stay, quicker recovery, and better cosmetic outcomes. With advancements in imaging, instrumentation, and surgical expertise, most benign adnexal masses can be accurately diagnosed and managed laparoscopically, even in complex cases. Importantly, careful patient selection and adherence to oncological principles are essential to minimize the risk of intraoperative spillage and ensure complete resection in cases where malignancy cannot be ruled out preoperatively. Laparoscopy should be considered the standard of care for the evaluation and treatment of adnexal masses in appropriately selected patients, with ongoing emphasis on surgeon training and evidence-based protocols to optimize outcomes.

References

1. Nezhat FR, et al. "Tissue extraction in minimally invasive gynecologic surgery." *Obstet Gynecol Clin North Am.* 2011.
2. FDA Safety Communication. "Laparoscopic Power Morcellators in Hysterectomy and Myomectomy." 2014.
3. Ghezzi F, et al. "Vaginal extraction of pelvic masses." *Am J Obstet Gynecol.* 2009.
4. Tinelli R, et al. "Endobag retrieval for dermoid cysts: risk of spillage and peritonitis." *J Minim Invasive Gynecol.* 2012.



Dr Chaitanya Ganapule
Chairperson, Endocrinology committee, FOGSI
Zonal coordinator,
AMOGS Director,
Neowoman Clinic
and Yash IVF, Pune

Tubal and Scar Pregnancy

Introduction

Ectopic pregnancy is defined as the implantation of a fertilized ovum outside the uterine cavity, with the fallopian tube being the most common site. Among ectopic pregnancies, tubal pregnancy accounts for over 90% of cases. Scar pregnancy, a form of ectopic pregnancy implanted in the myometrial tissue at the site of a previous cesarean section scar, is rare but increasing in incidence due to rising cesarean rates globally. Both conditions pose a serious risk to maternal health and fertility if not diagnosed and managed promptly.

Tubal Pregnancy

Epidemiology

Tubal pregnancy is the most common type of ectopic gestation, with an estimated incidence of 1–2% of all reported pregnancies globally, and higher rates in populations with increased risk factors like pelvic infections and assisted reproductive technology (ART) use [1].

Risk Factors

Several risk factors predispose to tubal pregnancy, including:

- Pelvic Inflammatory Disease (PID): Chlamydia trachomatis and Neisseria gonorrhoeae infections can cause tubal damage [2].
- Previous Ectopic Pregnancy: Recurrence risk is estimated at 10–25% [3].
- Tubal Surgery: Procedures like tubal ligation reversal or tuboplasty increase risk.
- Assisted Reproductive Technology (ART): IVF and ovulation induction are associated with higher ectopic implantation rates [4].
- Smoking: Alters tubal motility and ciliary function [5].

Pathophysiology

Tubal pregnancy results from impaired transport of the fertilized ovum to the uterine cavity. This delay or arrest, often due to structural or functional damage to the fallopian tubes, leads to implantation within the tube itself—most commonly in the ampullary portion.

Clinical Presentation

Typical symptoms include:

- Abdominal or pelvic pain
- Amenorrhea
- Vaginal spotting or bleeding
- Shoulder tip pain or syncope (suggestive of rupture and hemoperitoneum)

In cases of rupture, the patient may present with signs of hypovolemic shock.

Diagnosis

1. Quantitative β -hCG Measurement

- Normally, β -hCG levels double every 48–72 hours in early intrauterine pregnancy.
- In ectopic pregnancy, this rise is usually slower.
- A β -hCG level above the discriminatory zone (typically 1,500–2,000 mIU/mL) with no visible intrauterine pregnancy on transvaginal ultrasound raises suspicion.

2. Transvaginal Ultrasound (TVS)

- May show an adnexal mass, “tubal ring” sign, or free fluid in the cul-de-sac.
- Absence of intrauterine gestational sac despite elevated β -hCG is suggestive.

3. Culdocentesis or Diagnostic Laparoscopy

- Rarely needed with advances in imaging but can confirm hemoperitoneum or direct visualization of ectopic mass.

Management

Medical Management

Methotrexate, a folate antagonist, is the mainstay of non-surgical treatment. It is suitable for:

- Hemodynamically stable women
- No fetal cardiac activity
- β -hCG < 5,000 mIU/mL
- Ectopic mass < 3.5 cm

Protocols include single-dose or multi-dose regimens. Success rates range between 70–95% [6].

Surgical Management

- Salpingostomy: Removal of the ectopic pregnancy while preserving the tube; used in women desiring future fertility.
- Salpingectomy: Removal of the affected tube,

preferred if the tube is severely damaged or in cases of heavy bleeding.

Expectant Management

Applicable only when β -hCG levels are low and declining, and the patient is asymptomatic.

Prognosis and Future Fertility

- Fertility outcomes depend on the extent of tubal damage.
- Recurrence rates are 10–25% depending on the initial treatment approach [7].

Scar Pregnancy

Definition

Scar pregnancy (also called cesarean scar ectopic pregnancy) is the implantation of the gestational sac within the myometrial tissue of a previous cesarean section scar. It represents less than 1% of ectopic pregnancies but is increasing due to rising cesarean deliveries worldwide [8].

Pathophysiology

Implantation occurs in a microscopic dehiscent tract or defect in the lower uterine segment scar, which allows the blastocyst to invade the myometrium. The vascular nature of the scar area and poor decidualization contribute to abnormal implantation.

Two types are described:

- Type I (Endogenic): Grows toward the uterine cavity.
- Type II (Exogenic): Grows outward toward the bladder and peritoneal cavity, with higher rupture risk.

Risk Factors

- Previous Cesarean Sections
- Uterine surgery (e.g., myomectomy)
- Manual removal of placenta
- In vitro fertilization (IVF)

The risk increases with the number of cesarean sections [9].

Clinical Presentation

Often asymptomatic in early stages but may present with:

- Painless vaginal bleeding
- Lower abdominal pain
- In cases of rupture, signs of hypovolemic shock

Diagnosis

1. Transvaginal Sonography

Key findings:

- Empty uterine cavity and cervical canal
- Gestational sac embedded at the level of cesarean scar
- Thin or absent myometrium between the bladder and gestational sac
- Increased peritrophoblastic vascularity on color Doppler

2. MRI

Useful when ultrasound findings are inconclusive or for preoperative planning.

Differential Diagnosis

- Cervical pregnancy
- Miscarriage in progress
- Low-lying intrauterine pregnancy

Management

Medical Management

- Systemic or local methotrexate: Effective in early, hemodynamically stable cases.
- May require multiple doses and close monitoring.
- Adjuncts: KCl injection into the gestational sac or uterine artery embolization (UAE) to control bleeding [10].

Surgical Management

- Dilation and Curettage (D&C): Risky if done alone—should be preceded or followed by UAE or laparoscopy.
- Hysteroscopic or Laparoscopic Resection: Minimally invasive option for scar excision.
- Laparotomy: Reserved for rupture or unstable patients.

Expectant Management

Generally not advised due to high risk of uterine rupture, hemorrhage, and poor fetal outcome.

Prognosis and Future Pregnancy

- Future pregnancies carry a higher risk of placenta accreta, uterine rupture, and recurrent scar pregnancy.
- Interval repair of the uterine scar may be considered.
- A cesarean section is recommended for future deliveries.

Comparison: Tubal vs. Scar Pregnancy

Feature	Tubal Pregnancy	Scar Pregnancy
Commonality	Most common ectopic	Rare (<1%)
Risk Factors	PID, surgery, ART	Cesarean, uterine surgery
Implantation Site	Fallopian tube (ampulla most common)	Myometrial scar tissue
Diagnosis	Beta-hCG + TVS	TVS + MRI if needed
Complications	Tubal rupture, hemorrhage	Uterine rupture, massive bleeding
Management	Methotrexate or surgery	Methotrexate, surgery, UAE
Recurrence	10-25%	High risk; not well quantified

Conclusion

Tubal and scar pregnancies are potentially life-threatening conditions requiring a high index of suspicion and prompt management. While tubal pregnancy remains the most common form of ectopic pregnancy, scar pregnancy is gaining clinical relevance due to rising cesarean delivery rates. Advances in imaging and minimally invasive surgery have improved diagnostic accuracy and treatment outcomes. However, prevention through reduction of cesarean rates, timely treatment of PID, and careful ART protocols remains crucial.

References

1. Bouyer J, Coste J, Shojaei T, et al. Risk factors for ectopic pregnancy: a comprehensive analysis based on a large case-control, population-based study in France. *Am J Epidemiol.* 2003;157(3):185-194.
2. Barnhart KT. Clinical practice. Ectopic pregnancy. *N Engl J Med.* 2009;361(4):379-387.
3. Farquhar CM. Ectopic pregnancy. *Lancet.* 2005;366(9485):583-591.
4. Clayton HB, Schieve LA, Peterson HB, et al. Ectopic pregnancy risk with assisted reproductive technology procedures. *Obstet Gynecol.* 2006;107(3):595-604.
5. Saravelos SH, Li TC. Smoking, alcohol and drug use in assisted reproduction. *Hum Reprod Update.* 2011;17(4):438-451.
6. Stovall TG, Ling FW, Buster JE. Outpatient chemotherapy of unruptured ectopic pregnancy. *Fertil Steril.* 1989;51(3):435-438.
7. Bouyer J, Job-Spira N, Pouly JL, Coste J, Germain E, Fernandez H. Fertility following radical, conservative-surgical or medical treatment for tubal pregnancy: a population-based study. *BJOG.* 2000;107(6):714-721.
8. Rotas MA, Haberman S, Levгур M. Cesarean scar ectopic pregnancies: etiology, diagnosis, and management. *Obstet Gynecol.* 2006;107(6):1373-1381.
9. Maymon R, Halperin R, Mendlovic S, et al. Ectopic pregnancies in cesarean section scars: the 8 year experience of one medical center. *Hum Reprod.* 2004;19(2):278-284.
10. Timor-Tritsch IE, Monteagudo A, Cali G, et al. Cesarean scar pregnancy is a precursor of morbidly adherent placenta. *Ultrasound Obstet Gynecol.* 2014;44(3):346-353.



**Dr. Purushottam
Neurgaonkar**

Consultant Ob Gyn, Laparoscopic Hysteroscopic surgeon.
Diplomate Gynec endoscopy, Staten Island University, USA
Diploma Gynec endoscopy, Kiel University, Germany.

Hysteroscopic procedures – Tips & Tricks

Dear friends, it gives me immense pleasure to discuss with you all, about my 30-year-old and still ongoing affair with hysteroscopy. Hysteroscopy has proved to be a boon not only for the patients but also for the treating doctors. Dealing the problems within the small uterine cavity with still smaller diameter hysteroscope has altogether changed the management scenario of multiple gynaecological problems. Journey of hysteroscopy has gone through multiple changes and advances over last 40 years since its introduction to the gynaecologists.

To begin with, it's most important to think about possibility of scope for hysteroscopy in a given situation for the patient's clinical condition. Most of the times endometrial curettage can be supported with hysteroscopy and any incidental intrauterine pathology can be treated satisfactorily in the same sitting. In infertile patients it is advisable to peep in the uterine cavity along with diagnostic or operative laparoscopy.

Posting the patient for hysteroscopy preferably in early proliferative phase when endometrial lining is still thin, helps in better visualization of the uterine cavity and helps in better diagnosis and treatment of intra uterine polyps, endometrial growths, tubal canulation for proximal tubal obstruction etc.

One must keep in mind that uterine cavity is a potential space and it needs to be distended for visualization. Here comes the importance of distending media during hysteroscopy. After trying with various types of distending media, from CO₂, Hyscon, water-based gels, Glycine; now we have undoubtedly come to the conclusion of safety and efficacy of using Normal Saline for diagnostic as well as operative hysteroscopy. Closed pressure systems like pressure bags and good quality hysteromats have increased the safe use of distending medium. One must keep in mind to keep the pressure of the fluid as minimum as possible, only enough to help visualization and to give space for surgical interventions. With the use of NS and calibrated pressure systems complications arising out of distention media have been dramatically reduced.

Cervical softening with 100-200 mcg Misoprostol – per vaginal or sublingual - greatly helps in negotiating entry to uterine cavity. Taking it further, use of smaller diameter hysteroscopes has greatly helps easy entry into uterine cavity. Smaller diameter scopes have helped to make hysteroscopy as an office procedure.

For better visualization it is advisable to avoid over dilatation of cervix to prevent leakage of distending medium.

Once ready to perform hysteroscopy, one should check all the instruments and equipment on the operation trolley and video trolley. Assembling hysteroscope with its outer sheaths plays vital role, especially when using resectoscope for operating hysteroscopy. Rule of 5 attachments should be applied when we are doing operative hysteroscopy – Inflow, Outflow, Light source, Camera and Cautery - once all these are in place hysteroscopy usually is a safe and flawless procedure.

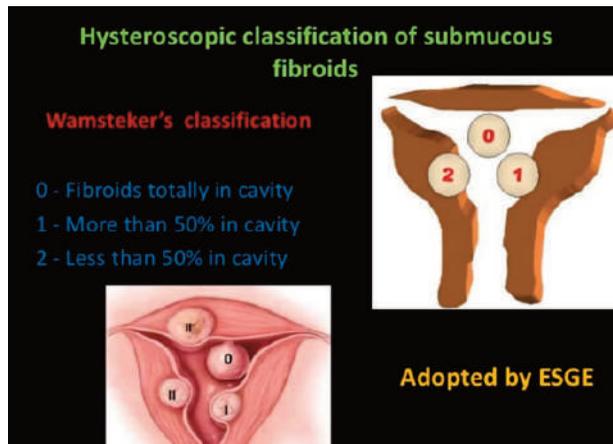
One of the safe but technically difficult procedure is hysteroscopic canulation for proximal tubal obstruction (PTO). Use of 0.9 mm Terumo guidewire with flexible distal tip helps to negotiate ostium and canula can be safely guided over the guidewire till ostium. Under laparoscopic vision guide wire can be seen entering the lumen of isthmic portion of the fallopian tube. It is then withdrawn and methylene blue dye can be pushed to look for the patency of the tubes. This simple procedure has given beautiful results of intrauterine pregnancies avoiding risks of cornual ectopic pregnancy.

Another rewarding hysteroscopic surgery is septum resection. One can opt for cold scissors when intrauterine septum is thin. For thick and broad-based septum use of energy source, preferably bipolar energy is recommended. Completion of septum resection can be judged by visualizing both the cornu from panoramic view at the level of isthmus.

It is advisable to start with laparoscopic assessment of uterine fundus before going ahead with hysteroscopic septum resection. Presence of single fundus of the uterus with or without small dimple at the fundus suggests that di-

vided uterine cavity is due to presence of septum and not due to any other uterine anomaly like bicornuate uterus.

Usually, hysteroscopic surgery is performed for intra-uterine lesions like endometrial polyps and fibroid polyps or submucous myomas. It has been observed that most of the times endometrial polyps are accidentally diagnosed during diagnostic hysteroscopy especially while doing hysteroscopy for abnormal uterine bleeding (AUB) with sonography report showing thick endometrium. Pedunculated lesions can be safely tackled with cold scissors, but sessile lesions and lesions attached with broad base need use of energy source. Submucous myomas need special attention. Before going ahead with hysteroscopic myoma resection, pre surgical evaluation of the lesion is of utmost importance. FIGO staging for submucous myomas helps before posting the myoma resection with hysteroscopy. This staging takes into consideration the percentage of part of myoma that protrudes inside the endometrial cavity.



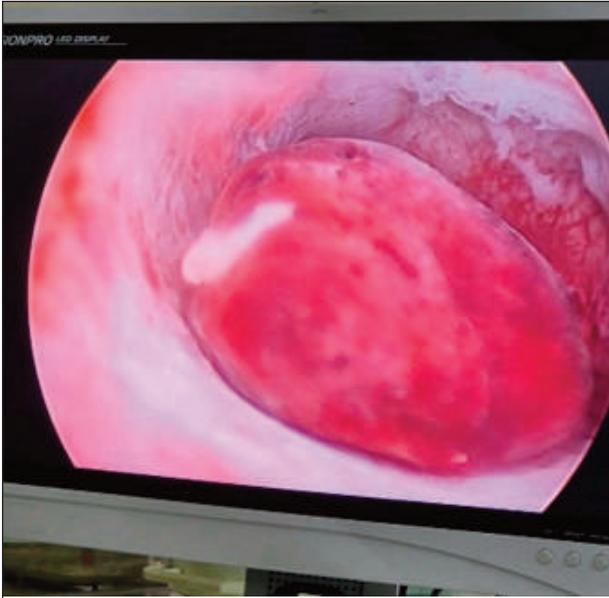
Surgeon should resort to stage 1 submucous myomas to begin with and as the experience and skills go up one can go ahead to tackle stage 2 myomas. Stage 3 myomas also can be resected with hysteroscope with expertise. One should know the thickness of myometrial tissue on the outer aspect of stage 2 myoma beforehand. Myomas having distance of serosa to outer surface of myoma less than 6mm can be safely removed laparoscopically instead of hysteroscopic approach.

TCRE is another procedure that gives best results in selected cases of AUB. Case selection with prior sonography that rules out presence of any intra myometrial lesions like myomas or adenomyomas. Care should be

taken to achieve to get adequate depth of the resection strips so as to include superficial surface of myometrial tissue. Success rates of TCRE are high with cases where good depth resection is achieved, which can be evident from histopathology study. TCRE can be combined with use LNG- IUS insertion or use of long-acting injectable progesterone depot.

Last important point is about fluid management during hysteroscopic surgery. Inflowing and outcoming volumes of distending medium should be meticulously calculated. With the advent of use of bipolar energy risk of Glycine absorption and its subsequent complications like TURP syndrome can be safely avoided. Still while using Normal Saline systemic fluid absorption and intravascular fluid overload and its pulmonary system affection should be kept in mind. Inflow and outflow deficit of 700 cc warrants close attention. Fluid deficit of 1200 cc should warrant finishing the procedure. Fluid deficit of 1500 cc is stage to stop the procedure and look after the fluid absorption management. Diuretics and proper maintenance of oxygenation are of help in such situations.





Intrauterine polyp



Septate uterus

diagnostic hysteroscopy and increase surgical skills to expert level.

Once adequate skills are acquired Hysteroscopy can become a passionate and lifetime love affair.

Wishing you all a great hysteroscopy experience ahead.

Few suggestions / tips for some specific hysteroscopic procedures-

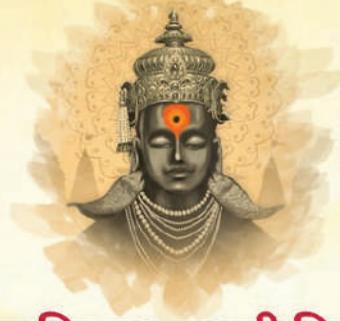
1. Uterine walls are thinnest near cornual areas.
2. While performing septum resection, it is advisable to under do than overdo.
3. Preferable to use cold scissors
4. When using cautery, prefer bipolar over monopolar.
5. Bipolar with normal Saline is safer than Monopolar with glycine as distending medium.
6. Do not activate foot pedal of the cautery when in doubt or when there is no proper vision.

Following certain precautions as mentioned and keeping positive and learning approach one can begin with

Upcoming Events



Pune Obstetric and Gynaecological Society & AMOGS



!!विठ्ठल विठ्ठल जय हरी विठ्ठल !!

गतवर्षीप्रमाणे यावर्षीपण अमोग्स जनजागृती समिती घेऊन येत आहे...

धार्मिक व सामाजिक उपक्रम चला वारीला

डॉक्टर-रुग्ण हे नाते विश्वास आदर आणि संवाद यावर आधारित आहे. सद्य परिस्थितीमध्ये डॉक्टरांची सकारात्मक प्रतिमा बळकट करण्यासाठी व लोकांपर्यंत पोहोचावण्यासाठी चला काढूया

स्नेहदिंडी

आपल्या सृजनशीलतेला वाव देऊन उचित घोषणावाक्य लवकरात लवकर आमच्यापर्यंत पोहोचावा व या नावीन्यपूर्ण पण अत्यावश्यक प्रकल्पात जास्तीत जास्त सहभागी व्हा...

अधिक माहितीसाठी संपर्क साधा

डॉ किरण कुर्तकोटी **डॉ बिपीन पंडित** **डॉ रेवती राणे**

अध्यक्ष महाराष्ट्र राज्य स्त्रीरोगतज्ञ संघटना

सचिव महाराष्ट्र राज्य स्त्रीरोगतज्ञ संघटना

अध्यक्ष अमोग्स जनजागृती समिती

आयोजक

डॉ मनीष माचवे

अध्यक्ष, पुणे स्त्री आरोग्य आणि प्रसूती शास्त्र संघटना

डॉ निलेश बलकवडे

सचिव, पुणे स्त्री आरोग्य आणि प्रसूती शास्त्र संघटना

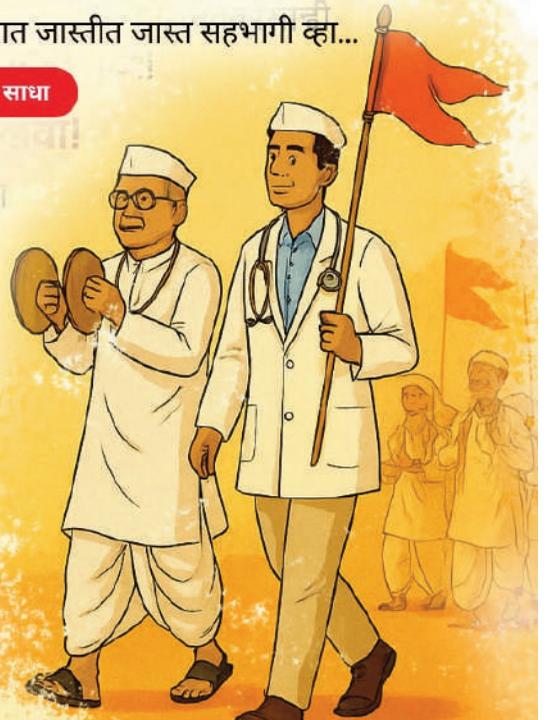
संयोजक

डॉ आरती निमकर

माजी अध्यक्षा, पुणे स्त्री आरोग्य आणि प्रसूती शास्त्र संघटना

डॉ वैशाली बिनीवाले

अध्यक्षा, POGS जनजागृती समिती





MAER MIT Pune's
MIMER Medical College & Dr. BSTR Hospital
Talegaon (D), Pune

DEPARTMENT OF OBSTETRICS & GYNAECOLOGY

Under the aegis of FOGSI, IAGE, POGS
organises

**ENDOSCOPY
MASTERCLASS 2025**

**Block the Dates
10th & 11th July
2025**

**4 MMC Points
awarded**



Contact : Dr. Sachin Vedpathak - 7741976340



Patrons

Prof. Dr. Vishwanath Karad
Founder President & Director General
MAER'S MIT Group of Institution, Pune, India
UNESCO Chair Holder

Dr. Virendra Ghaisas
Executive Director & Trustee

Dr. Suchitra Nagare
Executive Director &
Joint Managing Trustee

Dr. Sandhya Kulkarni
Principal

Dr. Sunita Tandulwadkar President, FOGSI **Dr. Kalyan Barmade** President, IAGE **Dr. Manish Machave** President, POGS

Dr. S Krishnakumar
Past President, IAGE

Head of the Department

Dr. Vaishali Korde

Organizing Chairpersons

Dr. Sushma Sharma
Dr. Jitendra Mane

Organizing Secretary

Dr. Sachin Vedpathak
Dr. Nilesh Balkawade

Convener

Dr. Priya Bagade
Dr. Kalyani Ingale




EAGLE

(Every Aspiring Gynecologist Learns Endoscopy)

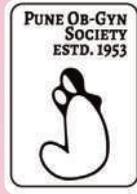
ENDOSCOPY MASTERCLASS 2025

Timings	10 th July 2025	Speakers
8:30 am to 9:15 am	Registration and Breakfast	
SESSION 1		
9:15 am onwards	Demonstration of live Laparoscopic surgeries (as per case availability) <ul style="list-style-type: none"> Total Laparoscopic Hysterectomy (TLH) Difficult Total Laparoscopic Hysterectomy (TLH) Laparoscopic Myomectomy Laparoscopic Ovarian Cystectomy Endometriosis 	
2:00 pm to 3:00 pm	Lunch	
SESSION 2		
3:00 pm to 3:20 pm	Keynote address - Endosuturing	Dr. Manish Machave
SESSION 3		
3:20 pm onwards	Hands on training for Endosuturing on Pelvitrainer	



ENDOSCOPY MASTERCLASS 2025

Timings	11 th July 2025	Speakers
8:30 am to 9:00 am	Breakfast	
SESSION 1		
9:00 am onwards	Demonstration of live Hysteroscopic surgeries (as per case availability) <ul style="list-style-type: none"> • Diagnostic Hysteroscopy • Asherman's Syndrome • Hysteroscopic Cannulation • Hysteroscopic Myomectomy • Hysteroscopic Polypectomy • Hysteroscopic Resection of Septum 	
2:00 pm to 3:00 pm	Lunch	
SESSION 2		
3:00 pm to 3:20 pm	Keynote address	Dr. S. Krishnakumar
3:20 pm to 3:40 pm	Keynote address	Dr. Kalyan Barmade
4:00 pm onwards	Valedictory Function	



POGS Outreach CME - Manchar



Wednesday 16th July 2025



8:00 pm - 10:00 pm

TBA



Dr. Manish Machave
President
POGS



Dr. Nilesh Balkawade
General Secretary
POGS



Dr. Kalyani Ingle
Clinical Secretary
Convenor - Outreach CME



Dr. Samidha Dalvi
Treasurer - POGS
Co – convenor



Dr. Bhushan Sali
Coordinator - Outreach CME
Manchar



Makers of



Pune Obstetric & Gynaecological Society

Announces



« ONLINE »



PG CONFERENCE



The Bull's Eye

(SAAND KI AANKH)

Know your examiners !!



Organising Chairperson
Prof. Dr. Vaishali Korde Nayak



Organising Secretary
Col. (Dr.) Sanjay Sharma



26th & 27th
July, 2025



Registration
1250 + GST



Dr. Manish Machave
President



Dr. Nilesh Balkawade
General Secretary



Dr. Kalyani Ingale
Clinical Secretary

E : pogsconference@gmail.com

W : www.pogs.in

3rd Aug infertility Masterclass



PUNE OBSTETRIC AND GYNAECOLOGICAL SOCIETY

ART MASTERCLASS

- ♦ ONE DAY
- ♦ ONE LEGEND
- ♦ INFINITE WISDOM

3RD AUG. 2025
9.00 AM TO 5.00 PM

**: VENUE :
HOTEL HYATT REGENCY,
PUNE**

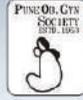
**DR JATIN SHAH
LIVE :**
**WHERE EXPERIENCE
MEETS EXCELLENCE**

DR. MANISH MACHAVE
PRESIDENT, POGS

DR. NILESH BALKAWADE
GENERAL SECRETARY, POGS

DR. KALYANI INGALE
CLINICAL SECRETARY, POGS

pogsoffice@gmail.com www.pogs.in



PUNE OBSTETRICS AND GYNAECOLOGICAL SOCIETY

AND

**ASSOCIATION OF MAHARASHTRA OBSTETRIC
AND GYNAECOLOGICAL SOCIETIES**

ANNOUNCES

BREASTCON 360°

Breast health, Lactation, Aesthetic Gynecology
.... and much more

Dates Save the

23RD & 24TH AUG. 2025

@ Hotel Rhythm,

Lonavala

ICOG, MCOG
& MMC POINTS
EXPECTED



**DR. MANISH
MACHAVE**

President
POGS



**DR. NILESH
BALKAWADE**

General Secretary
POGS



**DR. CHARULATA
BAPAYE**

Chairperson, Breast Health
Committee, FOGSI
Organising Chairperson



**DR. MANGLA
WANI**

Organising
Co Chairperson



**DR. KALYANI
INGALE**

Clinical Secretary
POGS

pogsoffice@gmail.com

www.pogs.in

FERTILITY CARNIVAL 2025

Innovations in Fertility, Rejuvenation in Goa

HOSTED BY
PUNE OBSTETRICS & GYNAECOLOGICAL SOCIETY
ALONG WITH
ISAR & AMOGS
IN ASSOCIATION WITH
PANAJI & MARGAO OBSTETRICS AND GYNECOLOGICAL SOCIETIES

Save the Dates
3RD | 4TH | 5TH
OCT. 2025
@ Holiday Inn Express
Cavelossim, **GOA**

DR. MANISH MACHAVE PRESIDENT, POGS ORGANISING CHAIRPERSON	DR. AMEET PATKI PRESIDENT, ISAR ORGANISING CHAIRPERSON	DR. KIRAN KURTKOTI PRESIDENT, AMOGS ORGANISING CHAIRPERSON
DR. NILESH BALKAWADE GENERAL SECRETARY, POGS ORGANISING SECRETARY	DR. ASHA BAXI SECRETARY, ISAR ORGANISING SECRETARY	DR. BIPIN PANDIT SECRETARY GEN., AMOGS ORGANISING SECRETARY

Rx In Male Infertility

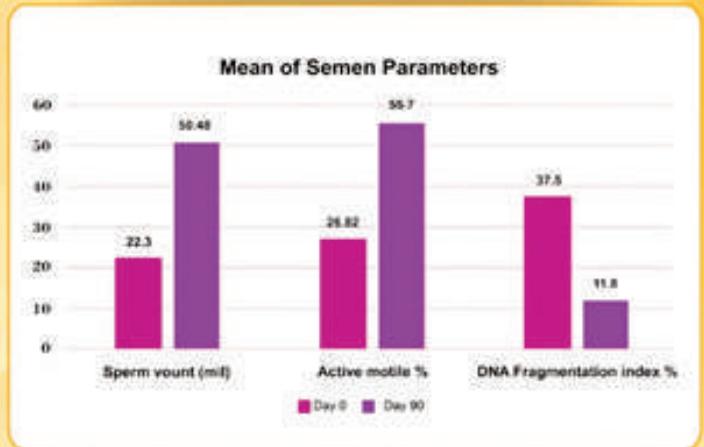
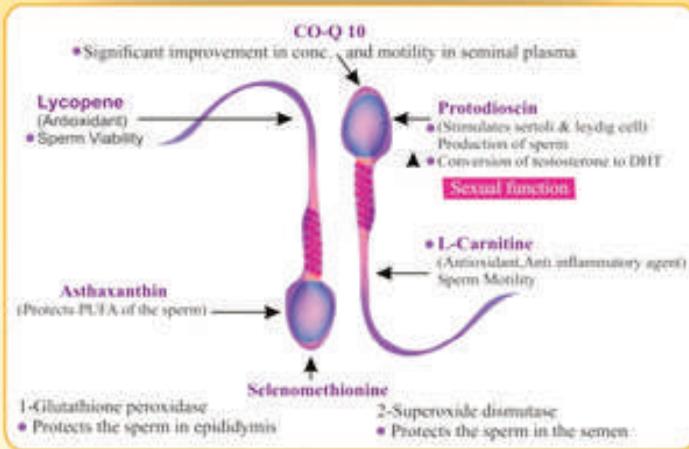
Zoafrag

L-Carnitine 500mg + COQ10 100mg, Protodioscin 40mg + Astaxanthin 10mg + Lycopene 1250mcg + Selenomethionine 40mcg Tablets

Role of adjuvants (Zoafrag) in male infertility

Original Research

Clinical Trial



Dose:
1 Tablet
BID



BellaFem
The Fem Era

02235046910

explore@bellafem.co.in

www.bellafem.in