AGL 2022

51st GLOBAL CONGRESS ON MIGS

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SYLLABUS

Surgical Tutorial 2: Tubal Disease

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The following members of AAGL have been involved in the educational planning and/or review of this course (listed in alphabetical order by last name).

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FACULTY DISCLOSURE

The following have agreed to provide verbal disclosure of their relationships prior to their presentations. They have also agreed to support their presentations and clinical recommendations with the "best available evidence" from medical literature (in alphabetical order by last name). Bala Bhagavath, MD – Contracted Research: PI for Hologic; Femasys; Myovant
Conor Harrity, FRCOG, FACOG, FRCPI*
Magdy P. Milad, MD, MS – Stock: Intuitive; Research Grants: Hologic, Storz; Consultant: Baxter; Myovant; Doximity

Surgical Tutorial 2: Tubal Disease

Chair: *Magdy P. Milad, MD, MS*

Faculty: *Bala Bhagavath, MD, and Conor Harrity, FRCOG, FACOG, FRCPI*

Course Description

Globally, tubal disease remains one of the most common causes of infertility. While assisted reproductive technologies are becoming more widely available, in many parts of the world, due to resources or financial constraints, patients may only have access to surgical interventions. Unfortunately, the majority of recently trained subspecialists have little exposure to tubal assessment and the tenets of tubal surgery. This course will review the assessment of tubal anatomy, patency and internal architecture, and explore the surgical approaches to tubal factor infertility from salpingectomy to tubal anastomosis. Additionally, we will review falloposcopy as an emerging method of evaluating the luminal milieu

Learning Objectives

At the conclusion of this course, the participant will be able to: 1) Interpret sono and radiologic HSG images of tubal occlusion; 2) Discuss many of the important tenets of tubal surgery; and 3) Hypothesize the role of falloposcopy in assessing for disease.

Course Outline

2:00 pm	Welcome, Introduction and Course Overview	M.P. Milad
2:05 pm	The Assessment of Tubal Patency and Health, Falloposcopy	C. Harrity
2:20 pm	Surgical Interventions Including Salpingectomy (before IVF), Tubal Cannulation, Distal Tuboplasty	B. Bhagavath
2:35 pm	Tubal Anastomosis	M.P. Milad
2:50 pm	Questions & Answers	All Faculty
3:05 pm	Adjourn	

Assessment of Tubal Patency and Health

Dr Conor Harrity FRCOG FACOG FRCPI
MIGS/REI, Beaumont and Rotunda Hospitals
FMIGS APD, Honorary Senior Lecturer, RCSI University
Medical Director, First IVF

RCSI UNIVERSITY OF MEDICINE AND HEALTH SCIENCES | BEAUMONT HOSPITAL | THE ROTUNDA HOSPITAL DUBLIN | FIRST IVF

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Disclosure

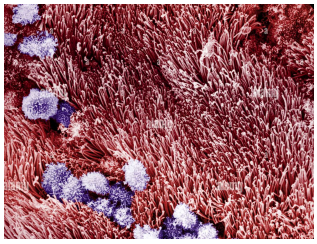
I have no financial relationships to disclose

Objectives

- Understand Tubal Function and Anatomy
- Evaluate Tests of Tubal Patency
- Rationale for modality choice
- Diagnosis of Tubal Pathology

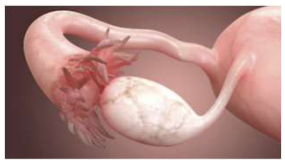
Tubal Function

- Conduit
  - Sperm Transit
- Reservoir
- Fertilisation
- Embryo Migration
  - Cilia
  - Tubal fluid
- Incubator
  - Cleavage



Anatomy

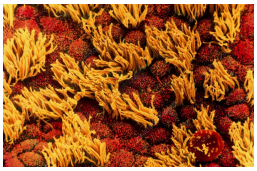
- Infundibulum
  → Fimbriae, oocyte pickup
- Ampulla
  → Most Plicae
  → Capacitation
  → Fertilisation
- Isthmus
  → Sperm reservoir
- Intramural

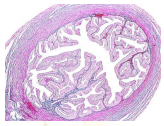


- 60% non-ciliated epithelial (secretory) cells
  - Percentage differs between regions (Pedrero-Badillo et al., 2013).

Structure

- Endosalpinx
  - Ciliated epithelial cells
  - Nonciliated secretory epithelial cells
- Lamina propria
  - Fibroblasts
  - Immune
  - Progenitor cells
    → Lgr5-positive cells for tubal epithelial cell regeneration
    (Ng et al, 2014; Snegovskikh et al, 2014)
- Mucosal layer:
  - dense internal folds
  - increase surface area
  - high secretory rate

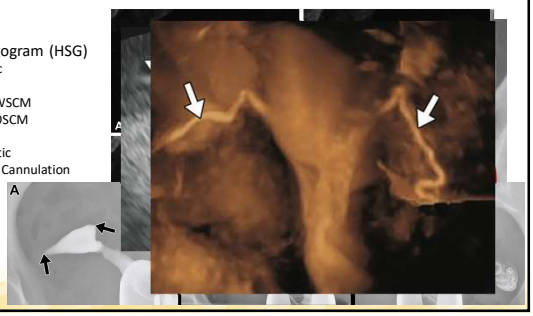




Assessment (Non-Invasive)

Hysterosalpingogram (HSG)
- Diagnostic
  - XR
    - WSCM
    - OSCM
  - MRI
- Therapeutic
  - Tubal Cannulation

USS
- 2D/3D
- HyCoSi
- Foam



HSG Contrast Media

OSCM
- Iodinated ethyl esters of the fatty acids of poppy seed oil (Lipiodol; Guerbet)
- Use for HSG was first described in 1925
- Until the 1950s predominant contrast material used
- Check TFTs before use

WSCM
- Lower anaphylaxis risk
- Avoids concerns related to venous intravasation of
  embolic consequences

ULTRASOUND in Obstetrics & Gynecology

Systematic Review

Effectiveness on fertility outcome of tubal flushing with different contrast media: systematic review and network meta-analysis

- Wang et al 2019
  - 14 RCTs (n=3852)
  - OR for clinical pregnancy within 6/12 = 1.67 (95% CI, 1.38–2.03)

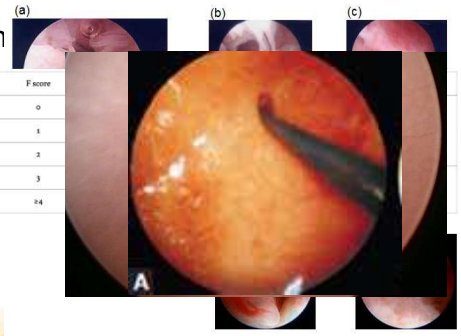
Diagnostic Accuracy

Test*	Sensitivity (%)	Specificity (%)
HSG (50, 51)	65–81	75–83
HyCoSy with air-saline (34)	76.1	79.4
HyCoSy with microbubble contrast material (52)	91	95
3D or 4D HyCoSy with microbubble contrast material (52)	95	94
HyFoSy (35)	87.5	100
Virtual CT HSG (53)	100	86
MR HSG (52, 54)	100	82–93

Grigovich M et al. Evaluating Fallopian Tube Patency: What the Radiologist Needs to Know. RadioGraphics 2021; 41:1876–1896

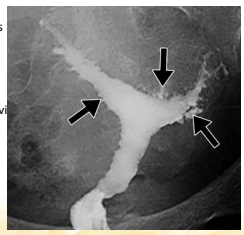
Assessmen

- Laparoscopy
  - Assessment
  - Chromopertubati
  - Salpingoscopy
- Hysteroscopy
  - Osteal Peristalsi
    - Bubble Suction
  - Falloposcopy



Which Test

- Low-risk patients
  - one-stop comprehensive USS + HyCoSy
- Fluoroscopic HSG
  - Suspion of adhesions, pre-existing tubal disease, adenomyosis
- Unexplained subfertility <38 years
  - HSG with OSCM
  - higher pregnancy rates and live births (H2Oil study)
- MR HSG
  - Simultaneous assessment of tubal patency and suspected pelvi
  - Congenital anomalies
- Laparoscopy
  - Pre-existing conditions (PID, endometriosis)
  - Hydrosalpinx
  - Chronic pelvic pain



Case 1

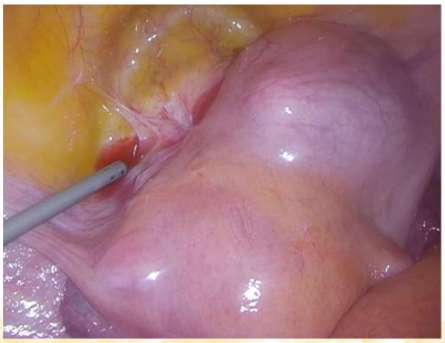
- 38, p1
  - CS, 5 years ago
- 4 years 2o SF
- PMHx:
  - HIV +ve
  - 4cm Fibroid
- AMH 2.9
- SA NAD

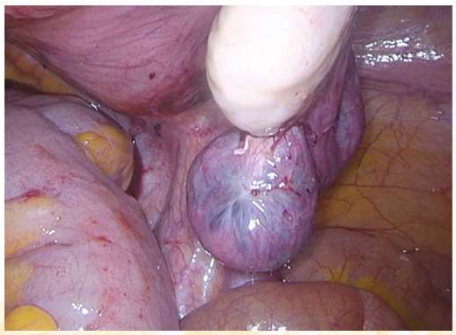
Options

1. HyCoSi
   - AFC, Fibroid
     - Not available in Public hospital
     - Unable to fund Privately

2. HSG
   - Rt Distal Occlusion
   - Lt Proximal Occlusion

3. Laparoscopy





Plan

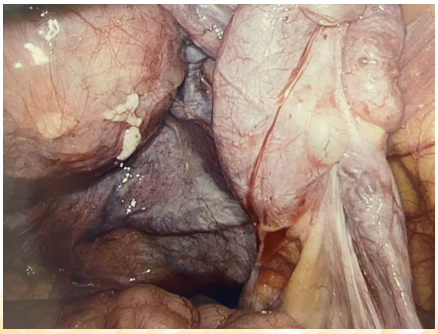
1. Rt Tube
   - Salpingectomy vs Distal Neosalpingostomy
     - ➔Financial
     - ➔MHx
       - ➔Salpingostomy
2. Endometriosis
3. Fibroid
   - Cavity
     - ➔Hysteroscopy

Case 2

- 32 p0, TTC x 4 yrs
- PMHx:
  - CPP
  - Laparoscopic ovarian cystectomy x 3
    - Histology:
      - Folicular cysts
      - No endometriosis
- AMH 6.9 pmolL-1, SA NAD
- IVF ➔ Failed ET x 2 (2 D5 remain)
- Cycle USS:
  - ?Rt Hydrosalpinx
  - Referred for Salpingectomy

Options

- Tubal Assessment
  - HSG
  - HyCoSy
  - MRI
  - Laparoscopy
- Questions
  - Treatment
  - Contralateral Tube
  - CPP



Plan

- Salpingectomy vs Salpingostomy
  - Chronic PID
    - Residual Ectopic Risk
  - IVF Outcome
- Lt Tube
  - Pt Consent
    - Conservation unless essential

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- Grigovich M et al. Evaluating Fallopian Tube Patency: What the Radiologist Needs to Know. RadioGraphics 2021; 41:1876–1896
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Surgical Interventions – Salpingectomy (before IVF), Tubal Cannulation, Distal Tuboplasty

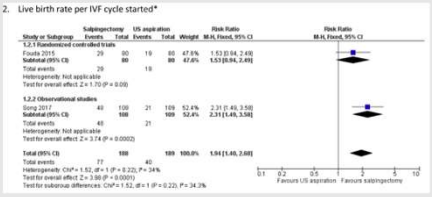
Bala Bhagavath, MD
Professor of OBGYN
Director, Division of REI

Disclosures

- Contracted Research – PI for Hologic, Femasys and Myovant

Salpingectomy before IVF

Does hydrosalpinx impact Live Birth?



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Does hydrosalpinx cause biochemical pregnancy?

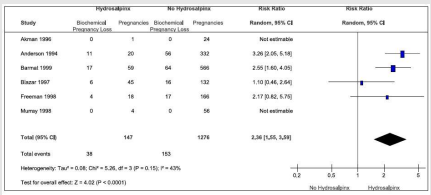


FIGURE 5 Meta-analysis of studies comparing biochemical pregnancy loss in women who had a hydrosalpinx to women who did not have a hydrosalpinx.

Harb H et al. Hydrosalpinx and pregnancy loss: a systematic review and meta-analysis. Reprod Biomed Online. 2019 Mar;38(3):427-441.

Does hydrosalpinx cause ectopic pregnancy?

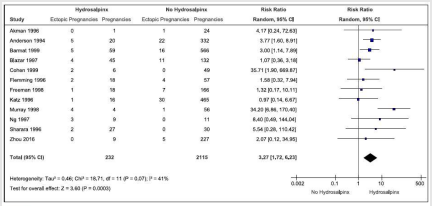


FIGURE 7 Meta-analysis of studies comparing ectopic pregnancy in women who had a hydrosalpinx to women who did not have a hydrosalpinx.

Harb H et al. Hydrosalpinx and pregnancy loss: a systematic review and meta-analysis. Reprod Biomed Online. 2019 Mar;38(3):427-441.

Does hydrosalpinx cause pregnancy Loss?

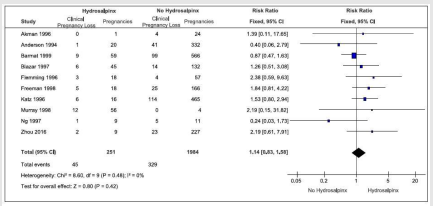


FIGURE 6 Meta-analysis of studies comparing clinical pregnancy loss in women who had a hydrosalpinx to women who did not have a hydrosalpinx.

Harb H et al. Hydrosalpinx and pregnancy loss: a systematic review and meta-analysis. Reprod Biomed Online. 2019 Mar;38(3):427-441.

Does removal of hydrosalpinx affect pregnancy loss?

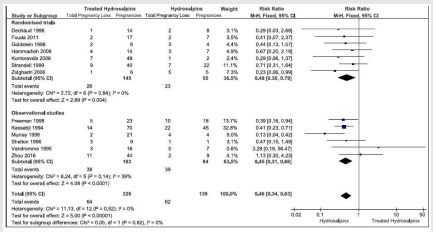


FIGURE 3 Meta-analysis of studies comparing total pregnancy loss in women who had treatment (all interventions) for hydrosalpinx to women who did not undergo treatment for hydrosalpinx subgrouped according to study type.

Harb H et al. Hydrosalpinx and pregnancy loss: a systematic review and meta-analysis. Reprod Biomed Online. 2019 Mar;38(3):427-441.

Does type of management of hydrosalpinx affect pregnancy loss?

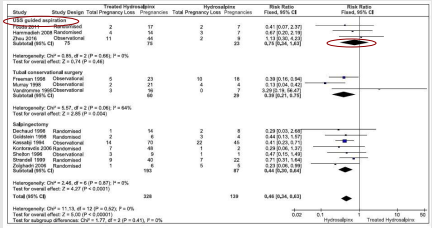


FIGURE 4 Meta-analysis of studies comparing total pregnancy loss in women who had treatment for hydrosalpinx to women who did not undergo treatment for hydrosalpinx subgrouped according to treatment type.

Harb H et al. Hydrosalpinx and pregnancy loss: a systematic review and meta-analysis. Reprod Biomed Online. 2019 Mar;38(3):427-441.

Does type of management of hydrosalpinx affect ectopic pregnancy?

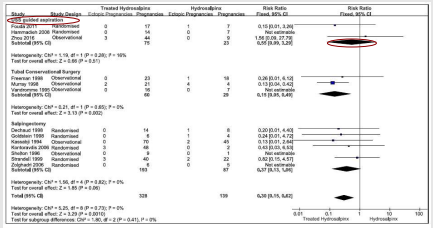


FIGURE 8 Meta-analysis of studies comparing ectopic pregnancy in women who had treatment for hydrosalpinx to women who did not undergo treatment for hydrosalpinx subgrouped according to treatment type.

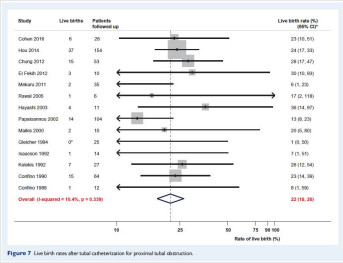
Harb H et al. Hydrosalpinx and pregnancy loss: a systematic review and meta-analysis. Reprod Biomed Online. 2019 Mar;38(3):427-441.

Conclusion regarding hydrosalpinx

Management of hydrosalpinx by salpingostomy or salpingectomy decreases biochemical pregnancies and pregnancy loss,possibly ectopic pregnancies and increases ongoing pregnancy and live birth rates

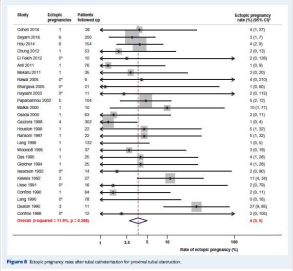
Tubal Cannulation

Does proximal tubal cannulation affect Live Birth Rate?



De Silva PM et al. Fallopian tube catheterization in the treatment of proximal tubal obstruction: a systematic review and meta-analysis. Hum Reprod. 2017 Apr 1;32(4):836-852. doi: 10.1093/humrep/dex022. PMID: 28184438.

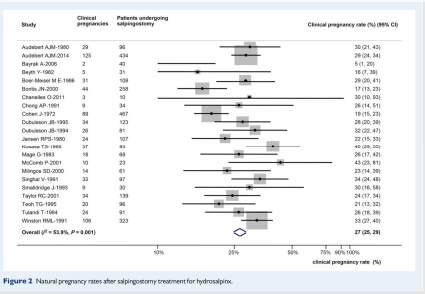
Does proximal tubal cannulation affect ectopic pregnancy rate?



De Silva PM et al. Fallopian tube catheterization in the treatment of proximal tubal obstruction: a systematic review and meta-analysis. Hum Reprod. 2017 Apr 1;32(4):836-852. doi: 10.1093/humrep/dex022. PMID: 28184438.

Distal Tuboplasty

Natural pregnancy rates after salpingostomy



Chu J et al. Salpingostomy in the treatment of hydrosalpinx: a systematic review and meta-analysis. Hum Reprod. 2015 Aug;30(8):1882-95..

Natural pregnancy rates after salpingostomy

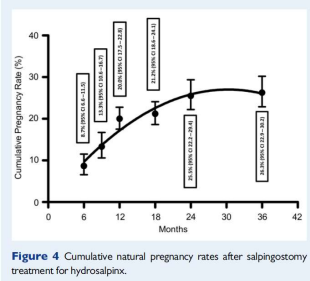
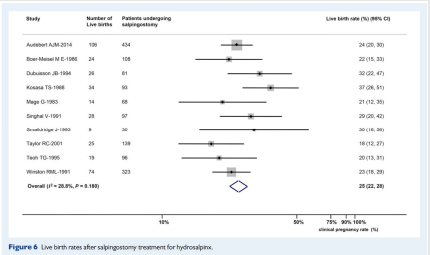


Figure 4 Cumulative natural pregnancy rates after salpingostomy treatment for hydrosalpinx.

Chu J et al. Salpingostomy in the treatment of hydrosalpinx: a systematic review and meta-analysis. Hum Reprod. 2015 Aug;30(8):1882-95..

Natural pregnancy rates after salpingostomy



Chu J et al. Salpingostomy in the treatment of hydrosalpinx: a systematic review and meta-analysis. Hum Reprod. 2015 Aug;30(8):1882-95..

Ectopic pregnancy rates after salpingostomy

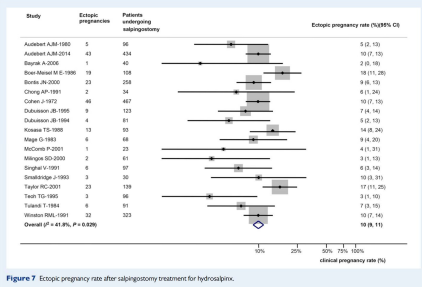


Figure 7 Ectopic pregnancy rate after salpingostomy treatment for hydrosalpinx.

Chu J et al. Salpingostomy in the treatment of hydrosalpinx: a systematic review and meta-analysis. Hum Reprod. 2015 Aug;30(8):1882-95..

Miscarriage rates after salpingostomy

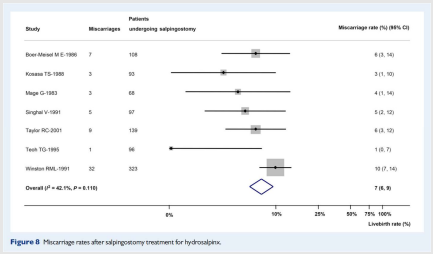
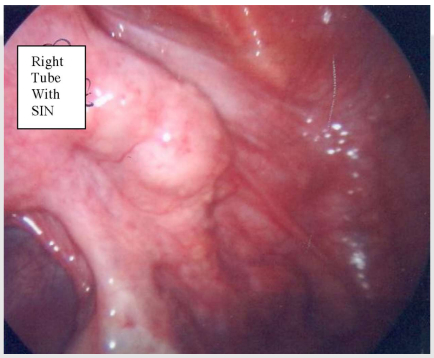


Figure 8 Miscarriage rates after salpingostomy treatment for hydrosalpinx.

Chu J et al. Salpingostomy in the treatment of hydrosalpinx: a systematic review and meta-analysis. Hum Reprod. 2015 Aug;30(8):1882-95..

Salpingitis Isthmica Nodosa



Classification of SIN

Histological classification of SIN.

Grade 1	The presence of lumens with tubal epithelium within the myosalpinx in an adequate cross section of the tube, through to the inner one-third of the myosalpinx
Grade II	Lesions extended through the inner two-third of the myosalpinx
Grade III	Lesions showed full extension through the myosalpinx to a subserosal location

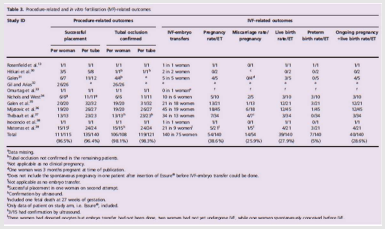
Management of SIN

- Most practical management – ART
- If ART not possible or not acceptable
  - Selective catheterization of proximal tube
    - 5/22 (23% pregnant with 4.5% ectopic) (Houston and Machan)
    - 20/65 (31% pregnant with 5% ectopic) (Thurmond)
  - Resection of affected segment and anastomosis of cut ends
    - 56% IUP and 11% Ectopic (Schmidt et al)

Bolaji et al. An odyssey through salpingitis isthmica nodosa.

Essure

Essure related IVF outcomes



Questions?

Tubal Anastomosis

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Disclosures

Stock
- Intuitive

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- Baxter
- Myovant Sciences
- Doximity

Medical expert

Objectives

- To review the history of tubal ligation and incidence of regret
- To improve understanding of the preoperative assessment
- To demonstrate surgical approaches to tubal anastomosis
- To discuss the factors that influence success of tubal anastomosis

History of Tubal Sterilization

- 1823 - Blundell first suggested tubal ligation for sterilization before the Medical Society of London.
- 1880 - Lungren (Toledo, OH) was first to perform a tubal ligation.
- 1895 - Dührssen used a double ligature and was the first to perform tubal ligation via colpotomy.
- 1897 - Kehrer and Buettner divided the tubes between the sutures.
- 1919 - Madlener crushed and ligated the tubes with nonabsorbable suture.
- 1924 - Irving published his method in which the proximal portion of the severed tube is buried.
- 1930 - Pomeroy technique published in the NY State J of Med posthumously by colleagues.
- 1936 - Bosch (Switzerland) performed the first laparoscopic tubal occlusion.
- 1940s - Uchida developed his technique.
- 1960s - Laparoscopic unipolar followed by bipolar electrocoagulation of the fallopian tube.
- 1973 - Hulka described a spring clip that could be applied laparoscopically.
- 1981 - Filshie introduced a titanium and silicone clip widely used in Europe.

Tubal Sterilization, Medscape, Jul 26, 2021, Chief editor: Robert K Zurawin, MD

Common Types of Tubal Ligation

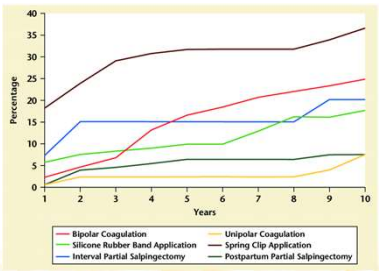
Electrosurgical

Pomeroy

Clip

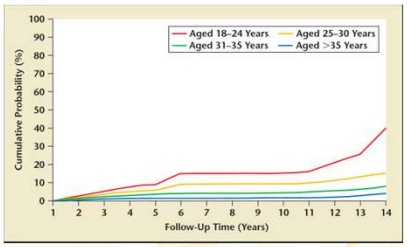
Ring

Tubal Ligation Failure Based on Type



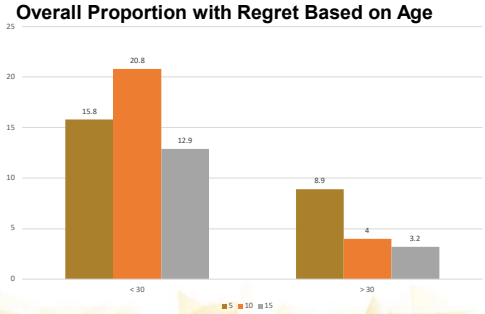
Bartz D, Greenberg JA. Sterilization in the United States. Rev Obstet Gynecol. 2008;1(1):23-32

Cumulative Regret Rate in the US



Bartz D, Greenberg JA. Sterilization in the United States. Rev Obstet Gynecol. 2008;1(1):23-32

Overall Proportion with Regret Based on Age



Wolters Kluwer

Danvers A, Evans TA. Obstet Gynecol 2022;139(3):433-439.

Risk Factors for Regret

- Less than 30 years old

US Collaborative Review of Sterilization "CREST". 1999;93:889-95.
Danvers A, Evans TA. Obstet Gynecol 2022;139(3):433-439.

Preop Workup

- Obtain previous operative and pathology report
- Hysterosalpingogram
- Semen analysis
- AMH level

Surgical Principles

- Gentle tissue handling
- Remove adhesions
- Freshen ends and identify lumen
- Confirm proximal patency
- Reapproximate mesosalpinx
- Reapproximate lumen with fine suture (microsurgical)
- Confirm distal spill

Surgical Access

- Laparotomic
- Laparoscopic
- Robotic
  - Single site
  - Multiport

Surgical Videos

Overall Success of Tubal Anastomosis

- 37 studies 10,689 women.
- No randomized controlled trials.
- Most studies were retrospective cohort studies of a moderate quality.
- The pooled pregnancy rate was 42-69%.
- The reported ectopic pregnancy rate was 4-8%.
- The only prognostic factor affecting the chance of conception was female age.
- The surgical approach (i.e., laparotomy [microscopic], laparoscopy or robotic) had no impact on the outcome.
- For older women, IVF could be a more cost-effective alternative.

Jacoba A H van Seeters JAH, Chua SJ, Bol BWJ, Koks CAM. Tubal anastomosis after previous sterilization: a systematic review. Hum Reprod Update 2017;1;23(3):358-370.

Conclusions

1. Tubal ligation regret is common, particularly at a younger age
2. Preoperative workup and counseling is essential
3. Age is the best predictor of success followed by the use of microsurgical technique and the length of the tube postop.
4. Patients should be counseled and monitored for tubal pregnancy.

References

1. Tubal Sterilization, Medscape, Jul 26, 2021, Chief editor: Robert K Zurwain, MD
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3. Danvers A, Evans TA. Obstet Gynecol 2022;139(3):433-439.
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7. Trolice M. Fertility after tubal ligation – It's a matter of 'AGE'. ObGyn News, March 28, 2022.

CULTURAL AND LINGUISTIC COMPETENCY & IMPLICIT BIAS

The California Medical Association (CMA) announced new standards for Cultural Linguistic Competency and Implicit Bias in CME. The goal of the standards is to support the role of accredited CME in advancing diversity, health equity, and inclusion in healthcare. These standards are relevant to ACCME-accredited, CMA-accredited, and jointly accredited providers located in California. AAGL is ACCME-accredited and headquartered in California.

CMA developed the standards in response to California legislation (Business and Professions (B&P) Code Section 2190.1), which directs CMA to draft a set of standards for the inclusion of cultural and linguistic competency (CLC) and implicit bias (IB) in accredited CME.

The standards are intended to support CME providers in meeting the expectations of the legislation. CME provider organizations physically located in California and accredited by CMA CME or ACCME, as well as jointly accredited providers whose target audience includes physicians, are expected to meet these expectations beginning January 1, 2022. AAGL has been proactively adopting processes that meet and often exceed the required expectations of the legislation.

CMA CME offers a variety of resources and tools to help providers meet the standards and successfully incorporate CLC & IB into their CME activities, including FAQ, definitions, a planning worksheet, and best practices. These resources are available on the CLC and IB standards page on the CMA website.

Important Definitions:

Cultural and Linguistic Competency (CLC) – The ability and readiness of health care providers and organizations to humbly and respectfully demonstrate, effectively communicate, and tailor delivery of care to patients with diverse values, beliefs, identities and behaviors, in order to meet social, cultural and linguistic needs as they relate to patient health.

Implicit Bias (IB) – The attitudes, stereotypes and feelings, either positive or negative, that affect our understanding, actions and decisions without conscious knowledge or control. Implicit bias is a universal phenomenon. When negative, implicit bias often contributes to unequal treatment and disparities in diagnosis, treatment decisions, levels of care and health care outcomes of people based on race, ethnicity, gender identity, sexual orientation, age, disability and other characteristics.

Diversity – Having many different forms, types or ideas; showing variety. Demographic diversity can mean a group composed of people of different genders, races/ethnicities, cultures, religions, physical abilities, sexual orientations or preferences, ages, etc.

Direct links to AB1195 (CLC), AB241 (IB), and the B&P Code 2190.1:

Bill Text – AB-1195 Continuing education: cultural and linguistic competency.
Bill Text – AB-241 Implicit bias: continuing education: requirements.
Business and Professions (B&P) Code Section 2190.1

CLC & IB Online Resources:

Diversity-Wheel-as-used-at-Johns-Hopkins-University-12.png (850×839) (researchgate.net)
Cultural Competence In Health and Human Services | NPIN (cdc.gov)
Cultural Competency – The Office of Minority Health (hhs.gov)
Implicit Bias, Microaggressions, and Stereotypes Resources | NEA
Unconscious Bias Resources | diversity.ucsf.edu
Act, Communicating, Implicit Bias (racialequitytools.org)
https://kirwaninstitute.osu.edu/implicit-bias-training
https://www.uptodate.com/contents/racial-and-ethnic-disparities-in-obstetric-and-gynecologic-care-and-role-of-implicitbiases
https://www.contemporaryobgyn.net/view/overcoming-racism-and-unconscious-bias-in-ob-gyn
https://pubmed.ncbi.nlm.nih.gov/34016820/