

Description of the Endometrium at the different phases of the Menstrual Cycle (A Handout)

Author: Amal Drizi¹

Affiliation: ¹ Independent consultant Ob/Gyn Algiers, Algeria

Abstract

On demand of a specific entity in New Zealand a practical handout based on images backed up by histology was conceived to help the junior residents to interpret the endometrial lining of the uterine cavity. The description of the vaginal epithelium and the cervical lining are not included in the handout.

Material and Methods:

The description of the endometrium is based on histological bases to explain the different layers under the surface epithelium – visible with the diagnostic hysteroscope. These findings are then correlated with the visible features, through the hysteroscope in a non-contact mode. These findings are related to the morphologic and histologic changes allowing for the dating of the endometrium. The different specific phases of the endometrial cycle are described by pictures.

Discussion:

The histological features of the Endometrium are correlated with the hysteroscopic aspect and can be a guide to screen the Endometrium during diagnostic procedures. However, the final diagnosis remains with the pathologist.

Key words: endometrium; hysteroscopy, handout, phases menstrual cycle

References:

1. Garbin O. Physiologie et physiopathologie de l'endomètre: apport de l'hystérocopie. In Hystérocopie et fertioscopie. Fernandez H, Garbin O, Gervaise A eds Elsevier Masson SAS 2013: 17-30.
2. van Herendael BK, Stevens MJ, Flakiewicz-Kula A, Hänsch Ch. Dating of the Endometrium by Microhysteroscopy. Gynecol Obstet Invest 1987; 24:114-18.
3. Mazur MT, Kurman RJ. Normal Endometrium and Infertility Evaluation. In : Diagnosis of Endometrial Biopsies and Curettings Mazur MT, Kurman RJ eds. Springer New York 2005 DOI: https://doi.org/10.1007/978-0-387-26321-2_2.

:

Amal Drizi

Limitations

Amal Drizi

Amal Drizi

Amal Drizi

Amal Drizi

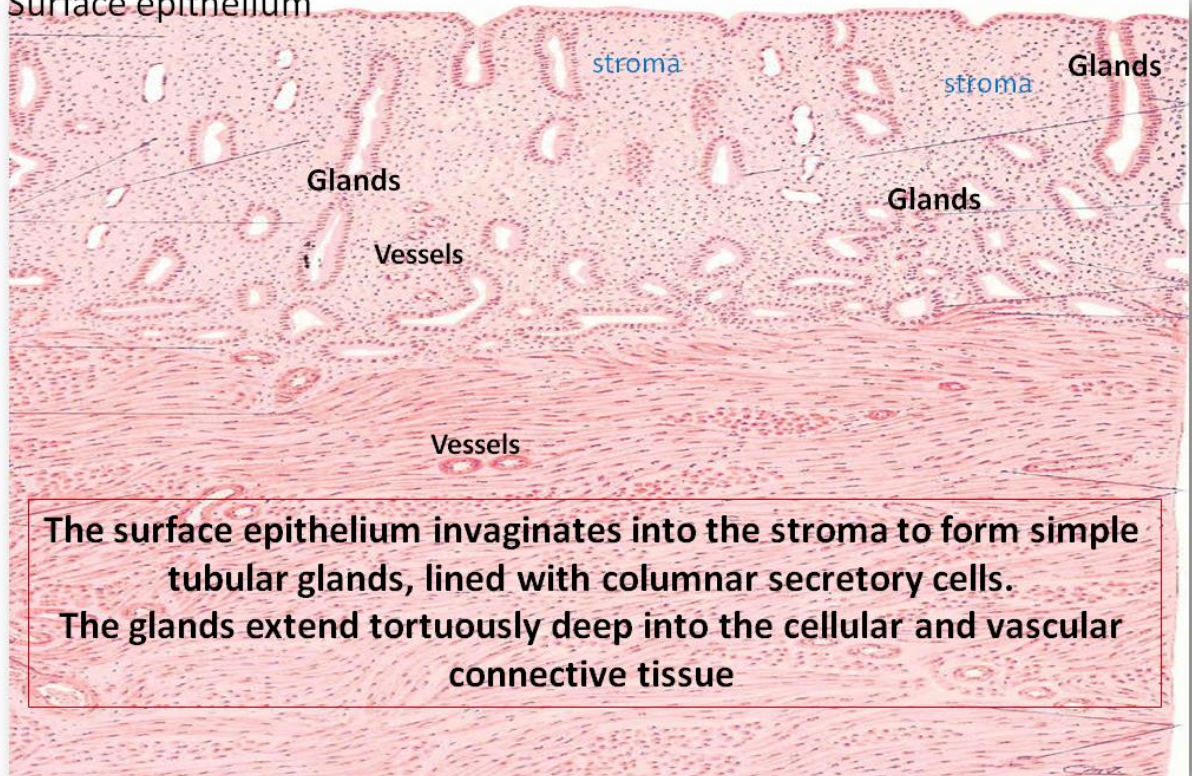
Amal Drizi

We are limiting the presentation to the endometrium.
(Cervix /vagina : excluded°)

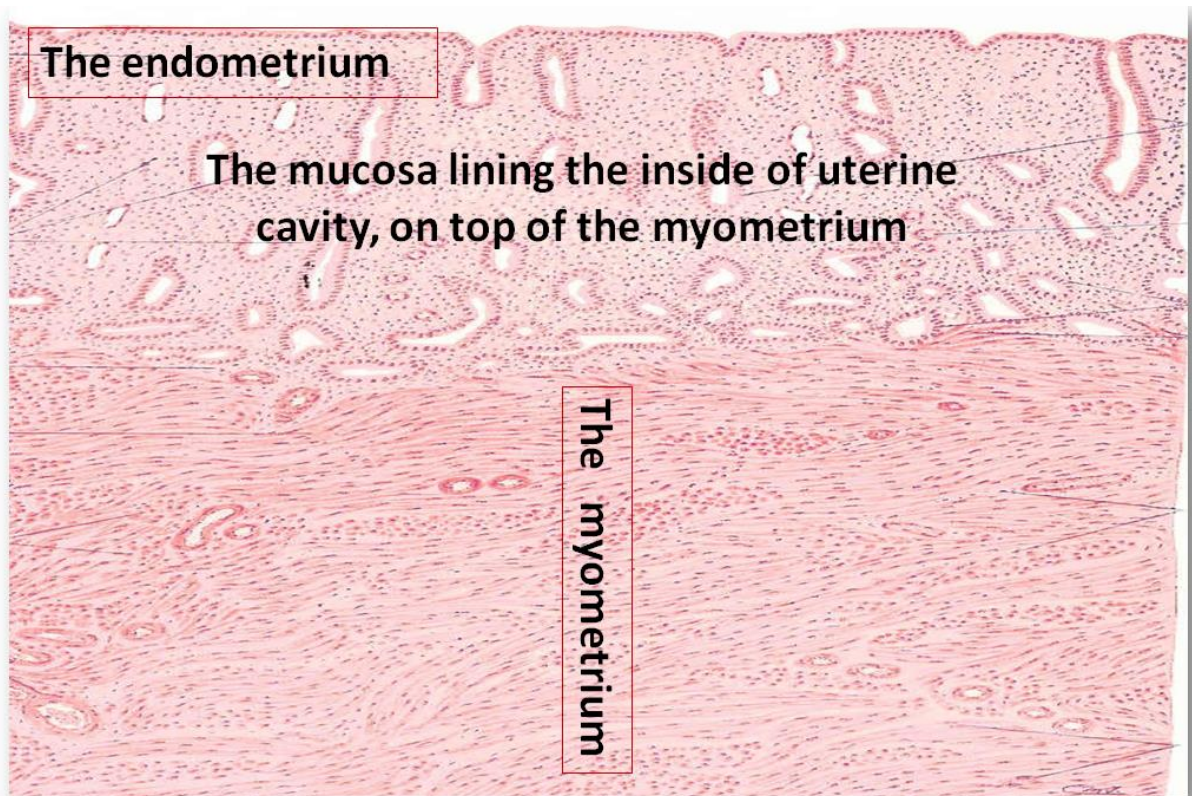
First

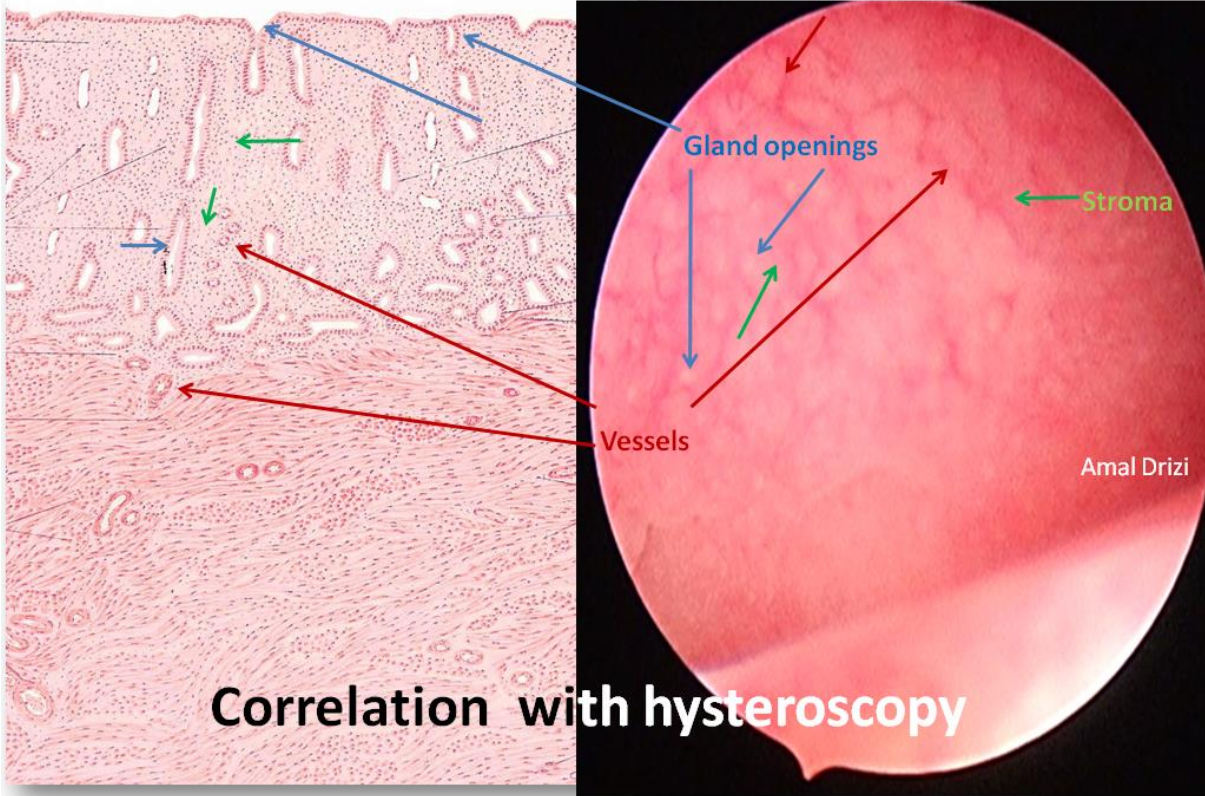
What is the endometrium?

Surface epithelium

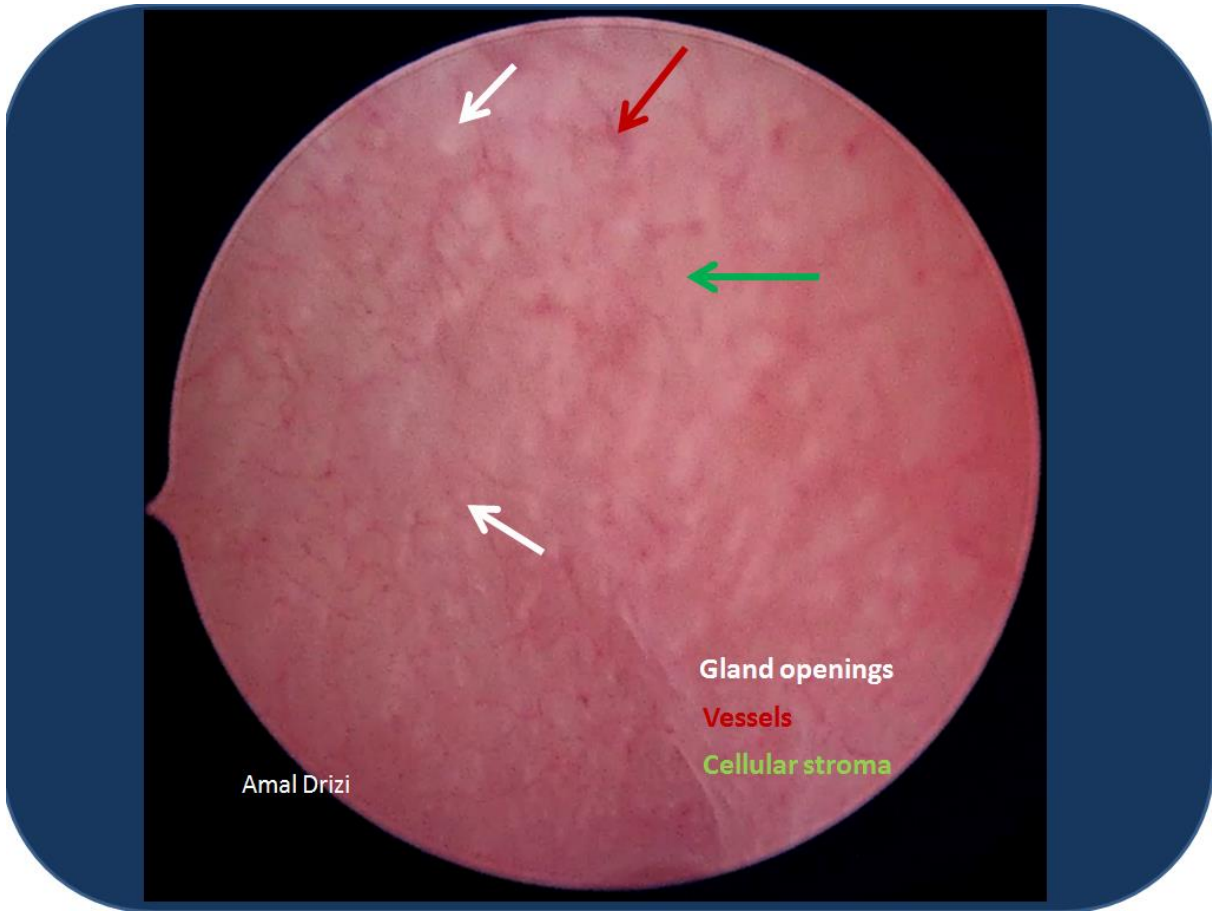


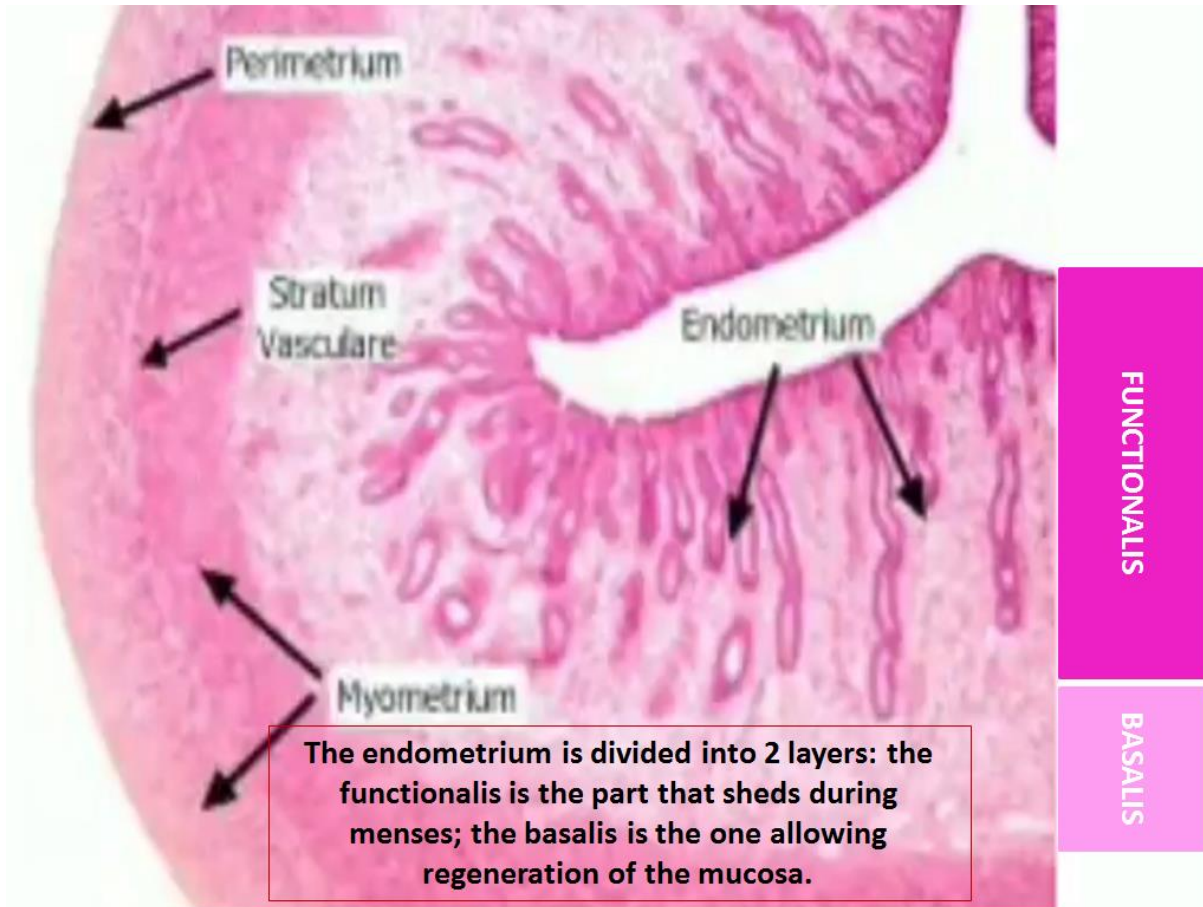
The surface epithelium invaginates into the stroma to form simple tubular glands, lined with columnar secretory cells. The glands extend tortuously deep into the cellular and vascular connective tissue





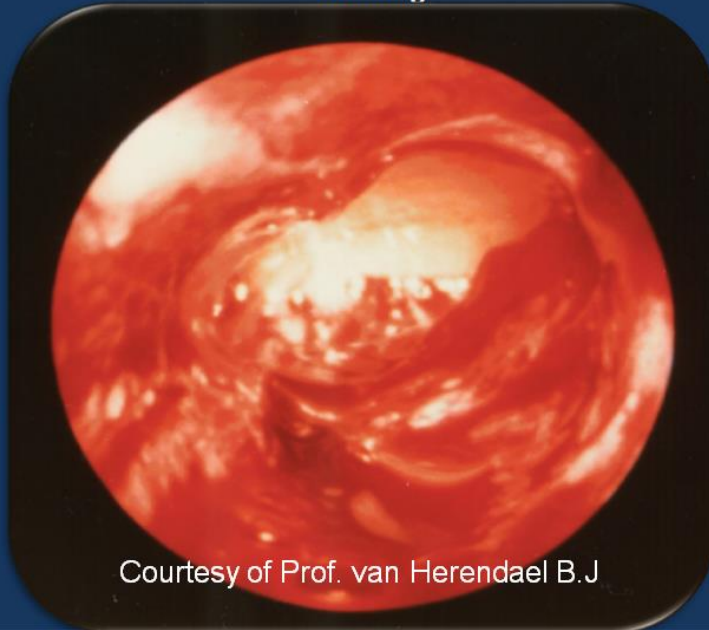
van Herendaël B.J., Stevens M.J., Flakiewicz-Kula A.,
Haensch Ch. "Dating of the Endometrium by
Microhysteroscopy." *Gynecol. obstet. Invest.* 1987; 24: 114-18





Menstruation

Thin endometrium, no gland ostia due to desquamation of the superficial endometrial layers during menstruation. Vascular and endometrial disorganization, petechiae and bleeding

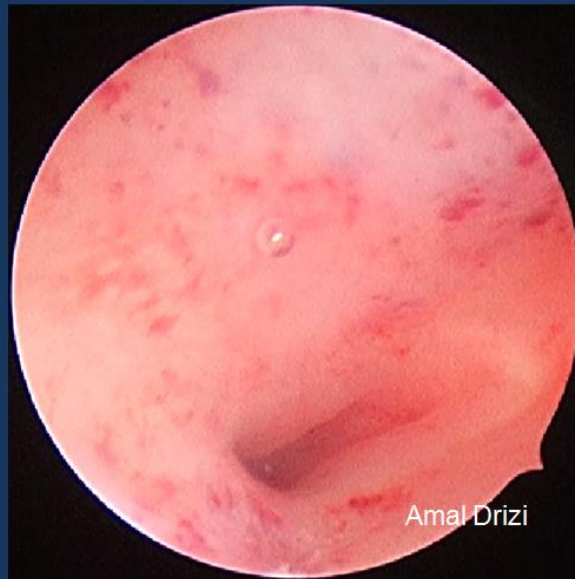


Courtesy of Prof. van Herendael B.J

EARLY PROLIFERATIVE ENDOMETRIUM

Right after menstruation: begins the regenerative phase. The endometrium is still thin, with no or few gland orifices. The underlying vessels are visible, as well as petechiae

The endometrium is still disorganized : desquamated in places and regenerating in others.



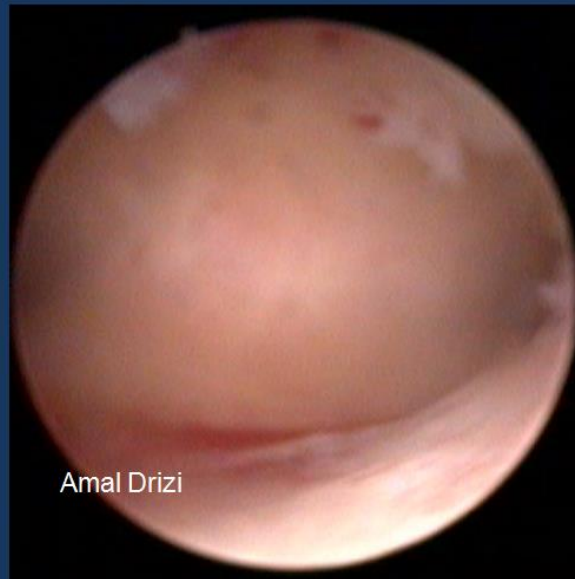
Normal endometrium
at day 6 of the
menstrual cycle

Amal Drizi

EARLY PROLIFERATIVE ENDOMETRIUM

Right after menstruation: begins the regenerative phase. The endometrium is still thin, with no or few gland orifices. The underlying vessels are visible, as well as petechiae

The endometrium is still disorganized : desquamated in places and regenerating in others.



Amal Drizi

Normal endometrium
at day 7 of the
menstrual cycle

EARLY PROLIFERATIVE ENDOMETRIUM

Right after menstruation: begins the regenerative phase. The endometrium is still thin, with no or few gland orifices. The underlying vessels are visible, as well as petechiae

The endometrium is still disorganized : desquamated in places and regenerating in others.



Amal Drizi

Normal endometrium
at day 6 of the
menstrual cycle

LATE PROLIFERATIVE ENDOMETRIUM

Under the influence of estrogens, the endometrium becomes thicker: regeneration of regularly spaced glands and vessels.

The endometrium takes yellowish-pinkish color.



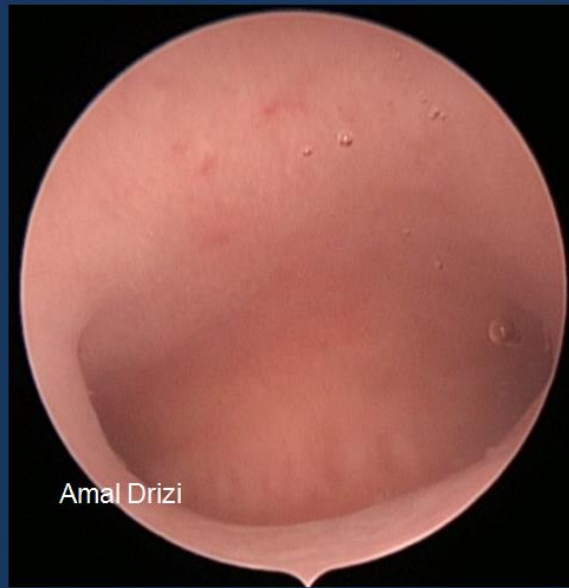
Amal Drizi

Normal endometrium
at day 12 of the
menstrual cycle

LATE PROLIFERATIVE ENDOMETRIUM

Under the influence of estrogens, the endometrium becomes thicker: regeneration of regularly spaced glands and vessels.

The endometrium takes yellowish-pinkish color.



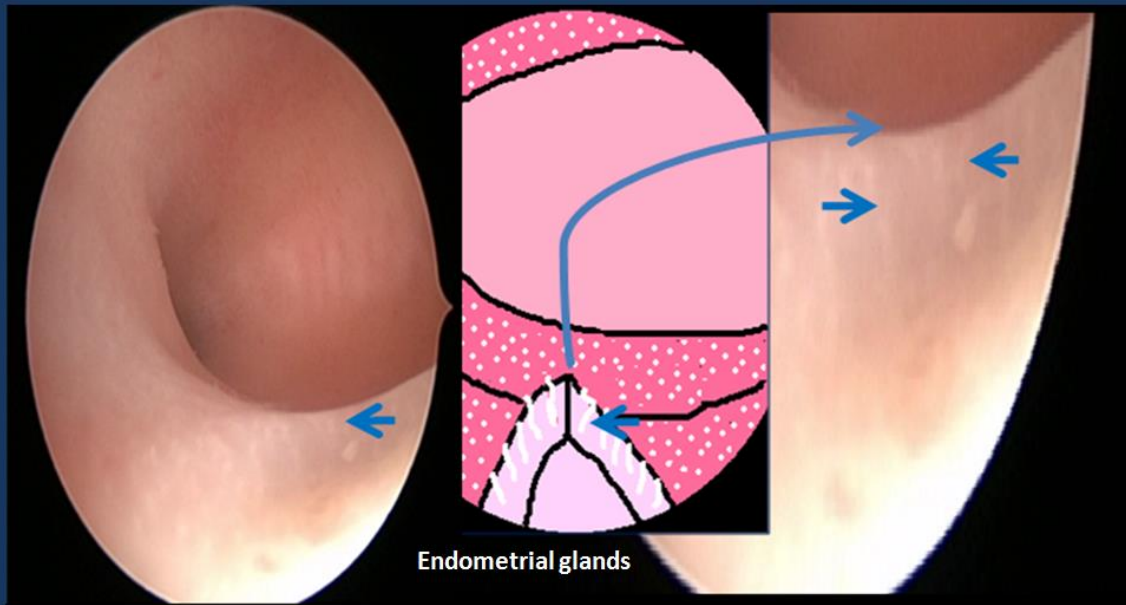
Amal Drizi

Normal endometrium
at day 9 of the
menstrual cycle

LATE PROLIFERATIVE ENDOMETRIUM

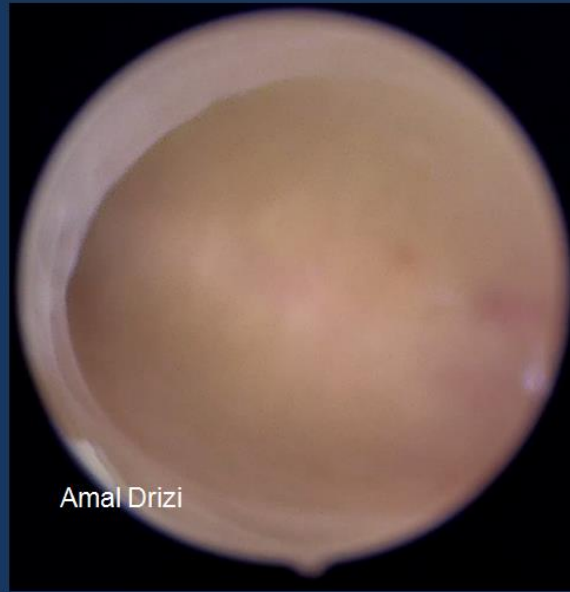
Under the influence of estrogens, the endometrium becomes thicker: regeneration of regularly spaced glands and vessels.

The endometrium takes yellowish-pinkish color.



EARLY SECRETORY ENDOMETRIUM

Under the effect of estrogen and progesterone: the endometrium becomes thicker and thicker, giving the appearance of undulations (or little waves) to the endometrial surface. Stromal edema gets maximum around day 21/23. Vascularization is more developed.

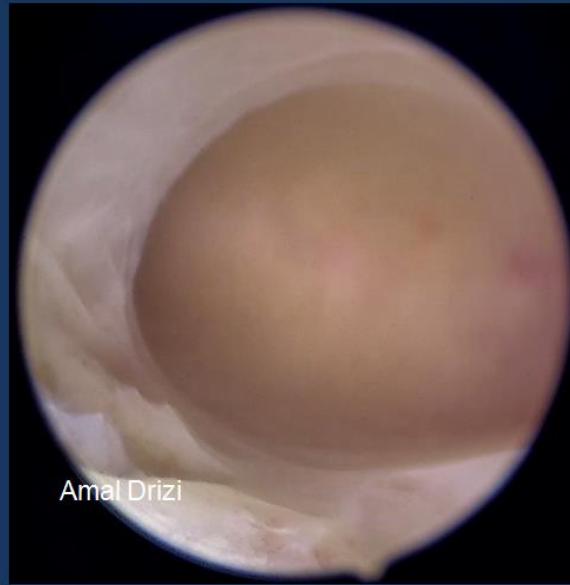


Amal Drizi

Normal endometrium
at day 21 of the
menstrual cycle

EARLY SECRETORY ENDOMETRIUM

Under the effect of estrogen and progesterone: the endometrium becomes thicker and thicker, giving the appearance of undulations (or little waves) to the endometrial surface. Stromal edema gets maximum around day 21/23. Vascularization is more developed.

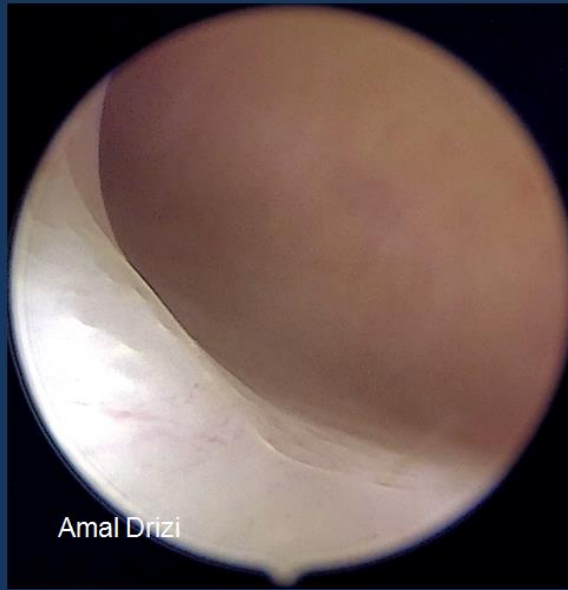


Amal Drizi

Normal endometrium
at day 21 of the
menstrual cycle

EARLY SECRETORY ENDOMETRIUM

Under the effect of estrogen and progesterone: the endometrium becomes thicker and thicker, giving the appearance of undulations (or little waves) to the endometrial surface. Stromal edema gets maximum around day 21/23. Vascularization is more developed.



Amal Drizi

Normal endometrium
at day 21 of the
menstrual cycle

LATE SECRETORY ENDOMETRIUM

At the end of the luteal phase, the endometrium is so thick that it needs to form big foldings to adjust to the cavity. At this phase of the cycle, this phenomenon is physiological and should not be confused with an endometrial hyperplasia.

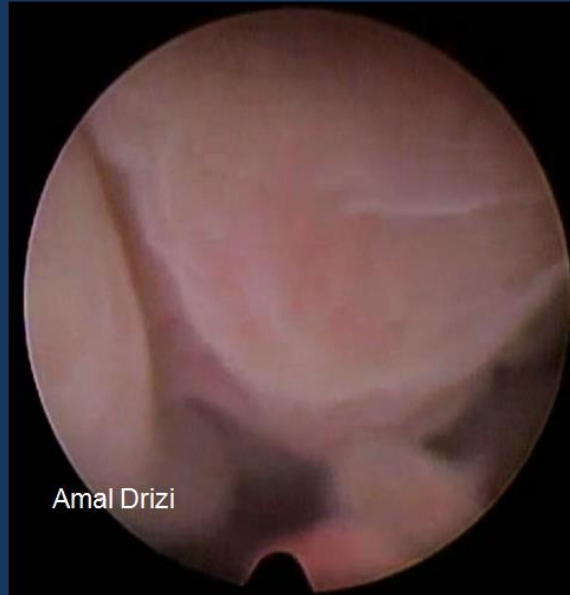


Amal Drizi

Normal endometrium
at day 26 of the
menstrual cycle.
Big foldings.

LATE SECRETORY ENDOMETRIUM

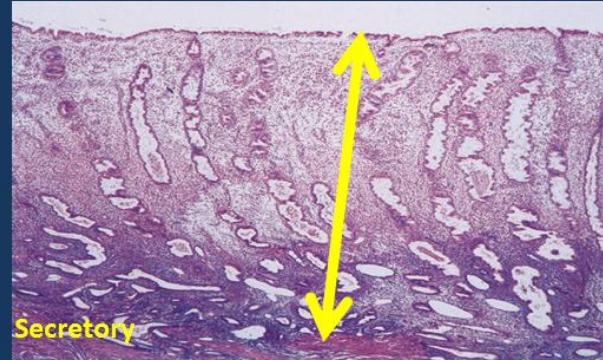
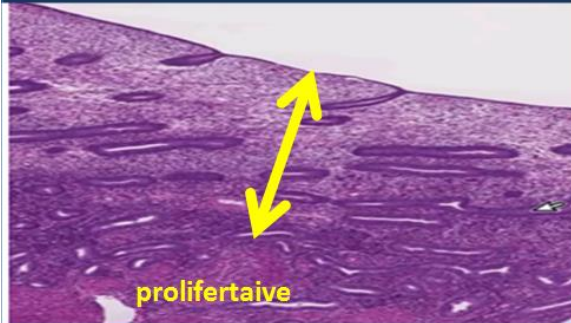
At the end of the luteal phase, the endometrium is so thick that it needs to form big foldings to adjust to the cavity. At this phase of the cycle, this phenomenon is physiological and should not be confused with an endometrial hyperplasia.



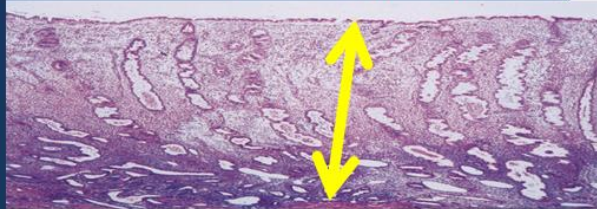
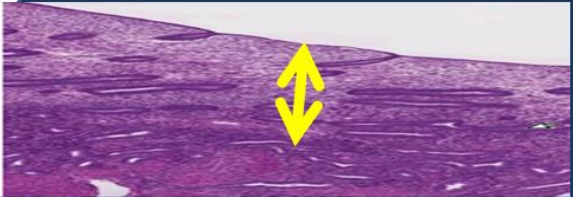
Amal Drizi

Normal endometrium
at day 26 of the
menstrual cycle.
Big foldings.

The difference between proliferative and secretory endometrium:
proliferative mucosa = half the thickness of the secretory one

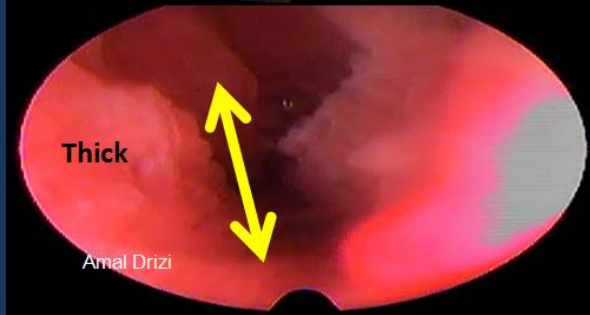
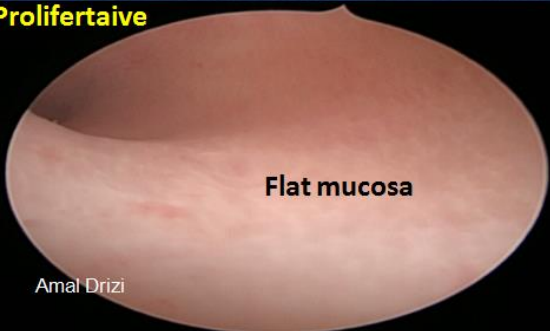


Thin mucosa (proliferative phase) Vs thick mucosa (secretory phase)



Prolifertaive

Secretory



Endometrium = responsive to hormones

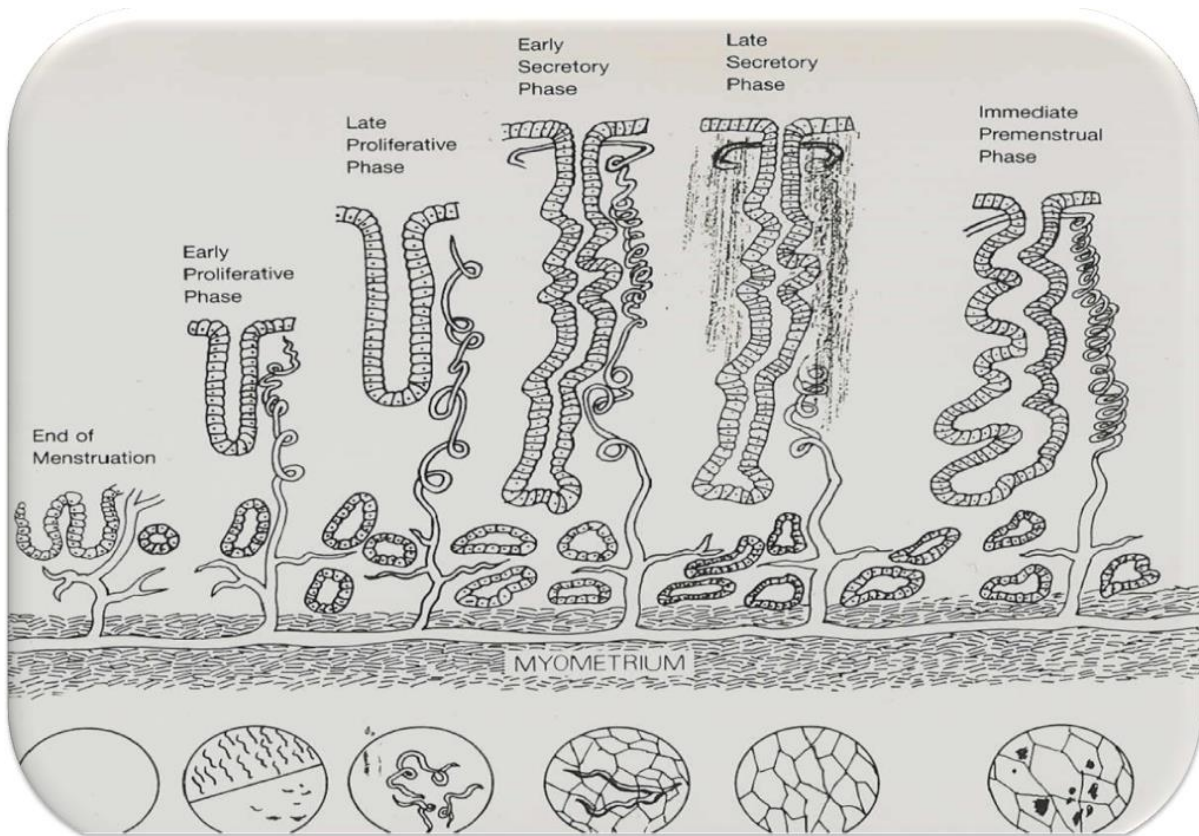
The date of the last menses must be specified+++++

The first questions before entering a uterine cavity: what day of the menstrual cycle is it? Is the patient under hormone therapy?

Vessels

Small spiral arteries and thin-walled venules are present at proliferative phase: less coiled and do not reach superficial parts of the endometrium.

Secretory phase: More coiled. Do reach superficial parts of the endometrium



van Herendael B.J., Stevens M.J., Flakiewicz-Kula A., Haensch Ch. " Dating of the Endometrium by Microhysteroscopy." *Gynecol.obstet.Invest.*1987; 24:114-18

Early Proliferative Phase : EPP 03-08/28

Late Proliferative Phase : LPP 09-13/28

Ovulation Phase : OP 14-16/28

Early Secretory Phase : ESP 17-22/28

Late Secretory Phase : LSP 23-25/28

Premenstrual-Menstrual : PMMP 26-28

Early
Secretory
Phase

Late
Secretory
Phase

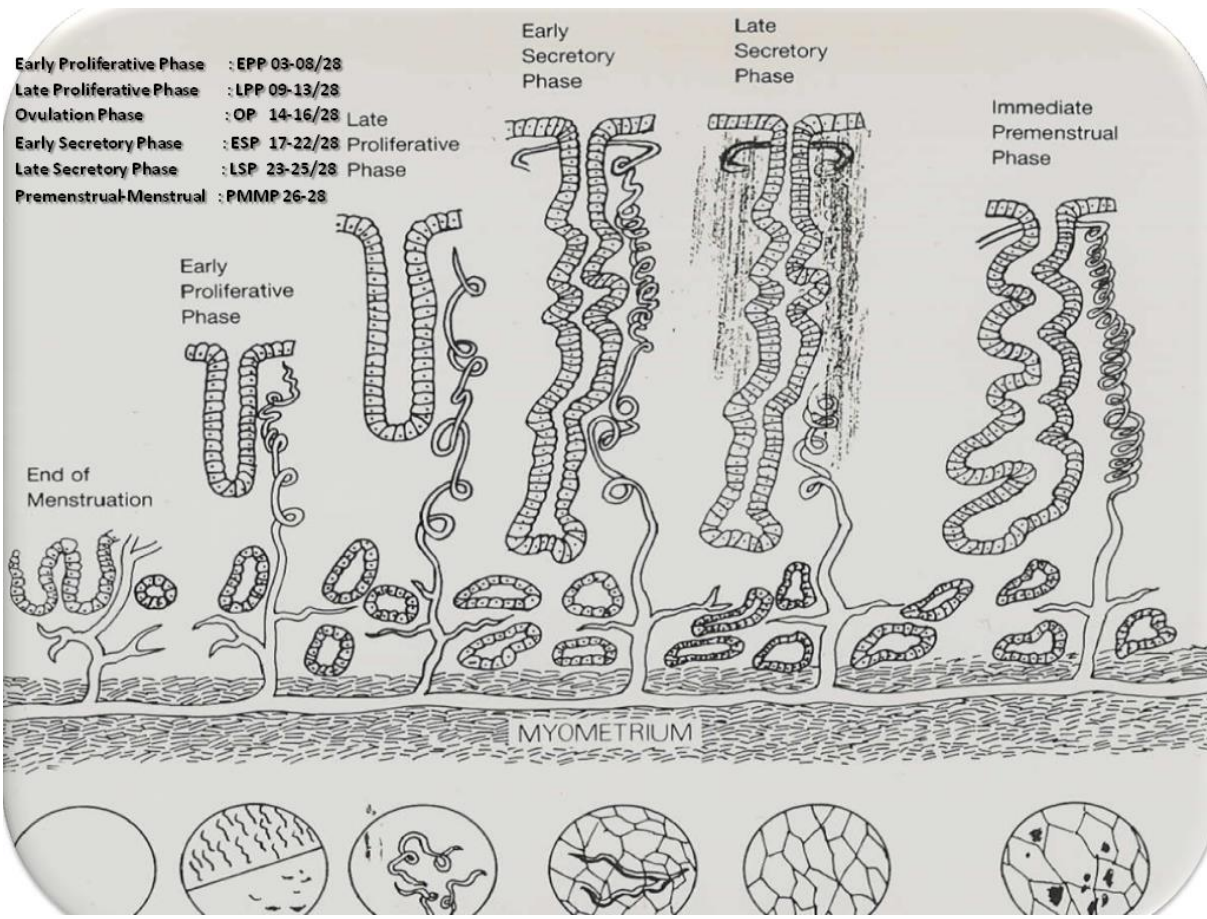
Late
Proliferative
Phase

Immediate
Premenstrual
Phase

Early
Proliferative
Phase

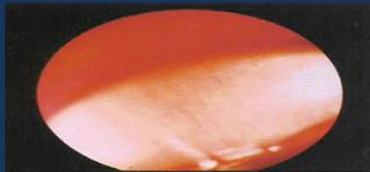
End of
Menstruation

MYOMETRIUM





Day 01-02



EPP day 03-08



ESP day 17-22



PMMP 26-28



LPP day 08-13



LSP day 23-25



Courtesy of Prof Bruno van Herendael

Conclusion

The histological features of the endometrium are correlated with hysteroscopy and have to be screened during diagnostic procedures.

The final diagnosis belongs to histology

References:

1. Garbin O. Physiologie et physiopathologie de l'endomètre: apport de l'hystérocopie. In Hystérocopie et fertioscopie. Fernandez H, Garbin O, Gervaise A eds Elsevier Masson SAS 2013: 17-30.
2. van Herendael BJ, Stevens MJ, Flakiewicz-Kula A, Hänsch Ch. Dating of the Endometrium by Microhysteroscopy. Gynecol Obstet Invest 1987; 24:114-18.
3. Mazur MT, Kurman RJ. Normal Endometrium and Infertility Evaluation. In : Diagnosis of Endometrial Biopsies and Curettings Mazur MT, Kurman RJ eds. Springer New York 2005 DOI:https://doi.org/10.1007/978-0-387-26321-2_2.