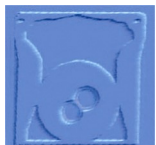


POOR OVARIAN RESPONSE

SURGERY

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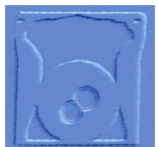


Slovene Institute for Fertility and Reproductive Surgery **SIFES**

WHAT CAN SURGERY DO?

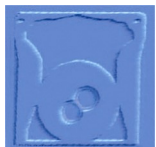
Preserve
ovarian
function

Threaten
ovarian
function



PRESERVATION OF THE OVARIAN FUNCTION

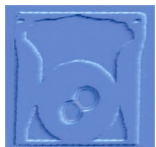
- Fertility-preserving surgery
 - premenarchal and adolescent patients with malignant ovarian germ cell tumors (5%)
 - ovarian tumors with low malignant potential (10-15 %), stage Ia
 - ovarian transposition procedure in teenaged girls for preventing ovarian damage from radiation therapy.



Malignant ovarian germ cell tumors

- 5 % of malignant tumors of the ovary
- More than 90 % occur in patients below 40 years of age
- In the majority of cases are unilateral
- Adnexectomy will suffice, even if the tumor extends beyond the ovaries
- Chemotherapy, e.g. with bleomycin, etoposid, and cisplatin leads to remission rates of > 90 %
- Up to 90 % have a normal menstrual cycle after surgery and chemotherapy

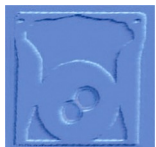
• Yoo et al. 2009



Ovarian tumors with low malignant potential (LMP)

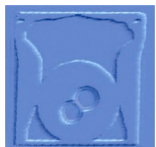
- Good prognosis of LMP-tumors (10-15%)
- 10 year survival, all stages, approx. 90 %
- Low rate of recurrences after conservative surgery (6.8 %)
- A fertility preserving operation is feasible in select cases also in more advanced stages than Ia.

- Kleine 1996



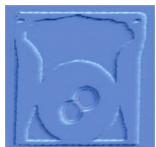
Ovarian transposition

- An easy and safe surgical procedure for teenaged girls
- Function preserved if the ovaries are transposed at least 3 cm from upper border of the field of irradiation or above the iliac crest with care to preserve ovarian vessels from injury
- Tulandi reported cases of laparoscopic lateral ovarian transposition in patient with rectal adeno-carcinomas he divided the utero-ovarian ligament but the ovaries remained attached to the distal fallopian tube to improve the chance for ovarian pickup and the patients achieved spontaneous pregnancies



Ovarian transposition - failure

- Ovarian failure may result after laparoscopic oophoropexy:
 - If the ovaries are not moved far enough out of irradiation field
 - Compromission of the ovarian vessels (surgical technique)
 - Radiation injury to the vascular pedicle.



THREATENED OVARIAN FUNCTION

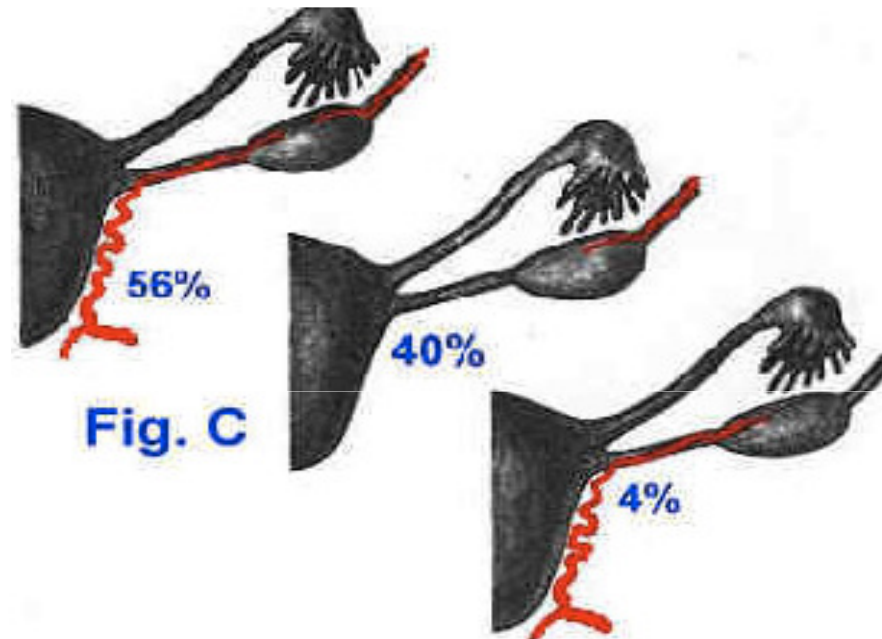
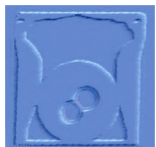


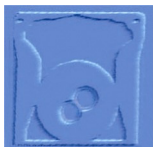
Fig.C: Arterial Supply to the Ovary

In 56% of cases blood to the ovary comes from both the ovarian and uterine arteries;
in 40% from the ovarian artery only;
in 4% from the uterine artery only.



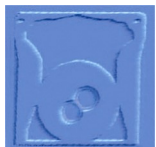
THREATENED OVARIAN FUNCTION

- **Blood supply and innervation**
- The ovarian arteries arise from the front of the aorta in a manner similar to the testicular arteries, but at the brim of the lesser pelvis they turn down into the pelvic cavity.
- Passing in the suspensory ligament of the ovary, **each artery reaches the broad ligament below the fallopian tube and then passes into the mesovarium to divide into branches distributed to the ovary.** One branch continues in the broad ligament to anastomose with the uterine artery.



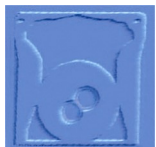
THREATENED OVARIAN FUNCTION

- **The ovarian veins** emerge from each ovary as a network that eventually becomes a single vein;
- The terminations are similar to those of the testicular veins.
- The nerves are derived from the ovarian nerve network on the ovarian artery.



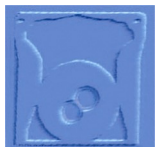
THREATENED OVARIAN FUNCTION

- Salpingectomy
- Tubal ligation for sterilization
- Laparoscopic ovarian drilling
- Endometriosis, endometrioma excision
- (Hysterectomy)



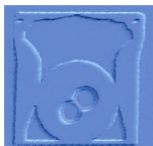
THREATENED OVARIAN FUNCTION - SALPINGECTOMY

- Prophylactic bilateral salpingectomy in the sub-group of patients with ultrasound-visible bilateral hydrosalpinges improved the IVF outcome
 - Strandell et al., 1999



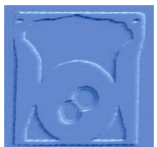
THREATENED OVARIAN FUNCTION - SALPINGECTOMY

- Three-dimensional (3D) ultrasound power Doppler imaging has been shown to be well correlated with ovarian response and subsequent IVF outcome
 - Kupesic and Kurjak 1999
- Lass et al. (1998) showed a reduction in the number of follicles >10 mm in mean diameter on the day of the hCG administration and the number of oocytes recovered from the operated side compared with the non-operated side
 - Lass 1998



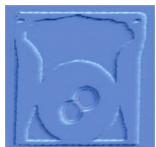
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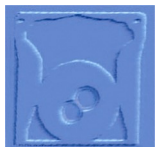
THREATENED OVARIAN FUNCTION

- Salpingectomy
- Tubal ligation for sterilization
- Laparoscopic ovarian drilling
- Endometriosis, endometrioma excision
- (Hysterectomy)



THREATENED OVARIAN FUNCTION – TUBAL STERILIZATION

- Sterilization may result in disruption of ovarian blood or nerve supply, producing gynecologic sequelae
 - (Huggins GR, Sondheimer SJ 1984)
- Evidences for hormonal or menstrual changes due to TS are weak. Tubal sterilization is associated with decreased risk of ovarian cancer.
 - (Westhoff C, Davis A., 2000)

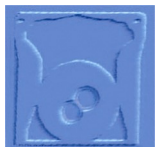


THREATENED OVARIAN FUNCTION - TUBAL STERILIZATION

- In a 12-month follow-up of patients who underwent tubal sterilization by the modified Pomeroy technique neither a decrease in ovarian reserve nor an adverse effect on the blood supply of ovarian stroma have been observed.

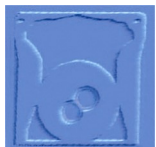
but

- A significant elevation of FSH levels was observed at 1 and 12 months after the operation
 - (Kelekci et al., 2005)



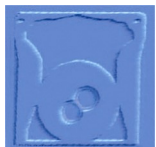
THREATENED OVARIAN FUNCTION

- Salpingectomy
- Tubal ligation for sterilization
- **Laparoscopic ovarian drilling**
- Endometriosis, endometrioma excision
- (Hysterectomy)



THREATENED OVARIAN FUNCTION – LAPAROSCOPIC OVARIAN DRILLING

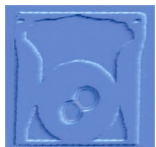
- Some of the reports described significant differences between Day 3 FSH, inhibin B levels, ovarian volume and antral follicle count before and after laparoscopic ovarian drilling.
- No evidence of a decreased ovarian reserve or premature ovarian failure associated with ovarian drilling in women with PCOS.
- Most of the changes in the ovarian reserve markers observed after LOD could be interpreted as **normalisation** of ovarian function rather than a reduction of ovarian reserve
 - (Api, 2009 review)



THREATENED OVARIAN FUNCTION – LAPAROSCOPIC OVARIAN DRILLING

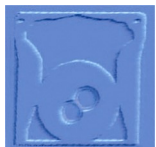
- Ovarian reserve assessed by hormonal levels and sonography seems to be lower in women with PCOS after ovarian drilling than in PCOS women without ovarian drilling.
- The PCOS women both with and without ovarian drilling had significantly greater ovarian reserve than the age-matched controls having normal ovulatory function.

- Weerakiet S 2005



THREATENED OVARIAN FUNCTION

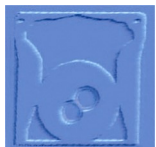
- Salpingectomy
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THREATENED OVARIAN FUNCTION – ENDOMETRIOMA EXCISION

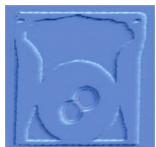
- No definitive data clarify whether the damage to the ovarian reserve, observed in patient with endometrioma, is related to the surgical procedure
- Electrosurgical coagulation during hemostasis or diathermocoagulation of the capsula could play an important role in term of damage to ovarian stroma and vascularization.

- Busacca M, Vignali M., 2009



THREATENED OVARIAN FUNCTION

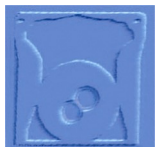
- Salpingectomy
- Tubal ligation for sterilization
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- Endometriosis, endometrioma excision
- (Hysterectomy)



THREATENED OVARIAN FUNCTION – HYSTERECTOMY

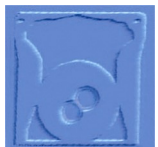
- Reduced PI values were observed on Doppler ultrasonography suggesting a decrease in the resistance flow in the ovarian arteries in women of reproductive age who underwent TAH.

- Petri Nahás et al., 2005



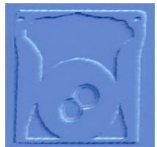
CONCLUSIONS

- Primum non nocere
(First, do not harm)



CONCLUSIONS - PRIMUM NON NOCERE

- Reduce the termic damage and the surface of the cauterization
- Prefer bipolar rather than monopolar electric energy
- Consider to avoid surgery in case of asimptomatic endometriomas smaller than 3-4 cm
- In case of cyst stripping do the haemostasis by suture rather by diathermocoagulation



CONCLUSIONS

- Adhesiolysis may improve the ovarian function?