VARICOCELE ET AZOOSPERMIE NON OBSTRUCTIVE

JOURNEES D'ANDROLOGIE DE L'AAU
1&2 SEPTEMBRE 2022.

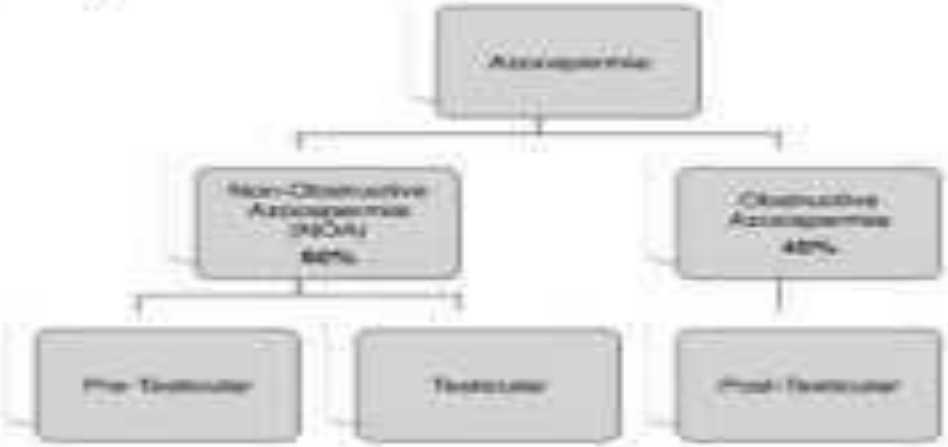
Dr K. Hachi

Une Grossesse à tout prix……..

LES AZOOSPERMIES

Azoospermia

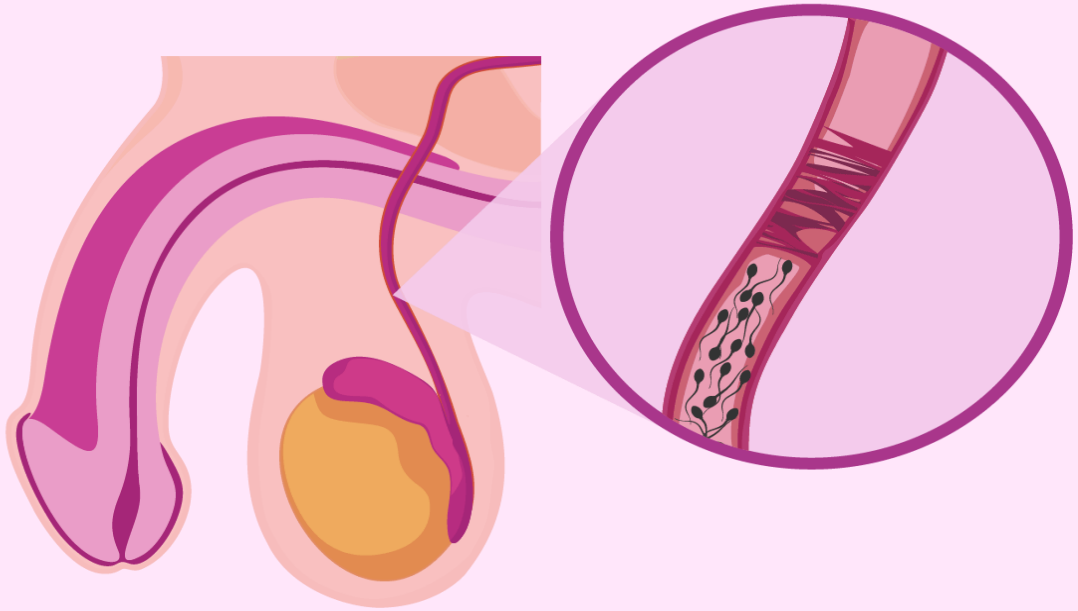
- Complete absence of sperm in two samples



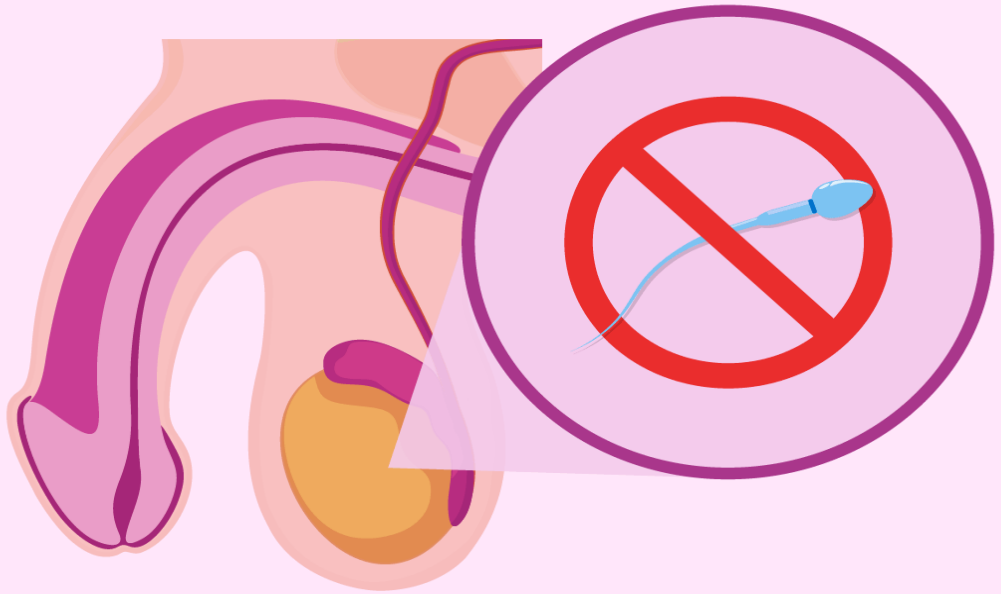
Left: Semen sample with sperm.
Right: Azoospermic sample, WBCs only

Flannigan R, Schlegel P. Azoospermia: Testicular Biopsy and Surgical Sperm Retrieval. AUA Update Series. 2017;36:85-93
Images courtesy of user Rodrigolimbo, Wikimedia Commons. https://commons.wikimedia.org/wiki/File:Sperm_stained.JPG and https://commons.wikimedia.org/wiki/File:Semen_analysis.JPG

LES AZOOSPERMIES



Obstructive azoospermia



Non-obstructive azoospermia

VARICOCELE et A.N.O

- INFERTILITE MASCULINE due à l'A.N.O en constante évolution.
- Centres de PMA : TESE +++++

- Varicocelectomie : challenge de l'amélioration du PNC de l'infertilité masculine (UROLOGUE)
- Peut on améliorer le PNC / N.O.A ?

Quelques chiffres ……

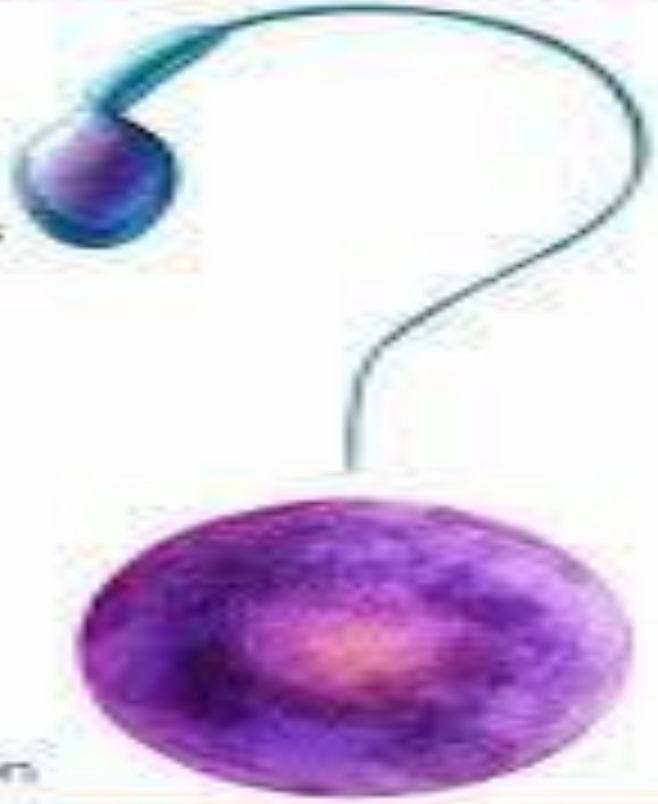
- A.N.O : Représente un challenge difficile dans la Prise en charge de l'infertilité masculine .
- Azoospermie : 1% de la population masculine et 10 à 15% des infertilités masculines .
- Varicocele palpable : 4 à 14 % des NOA (Schlegel)
- 1ere grossesse spontanée / N.O.A et varicocele opérée : TULLOCH 1952 .

ETIOLOGIES DES A.N.O

CAUSES OF NON-OBSTRUCTIVE AZOOSPERMIA (NOA)

In men suffering from NOA, abnormalities are present within the testicle or with reproductive hormones that control sperm production. Possible causes:

- Genetics: Abnormalities with certain chromosomes
- Varicocele: Varicose veins around the testicle
- Hypospermatogenesis: Low amounts of sperm production inside the testicle
- Maturation Arrest: Problem with development of mature sperm
- Testicular Cancer: Very low sperm count can be first sign
- Medical Treatments: Chemotherapy & radiation
- Prescription Drugs: Testosterone replacement & anabolic steroids can cause temporary sterilization



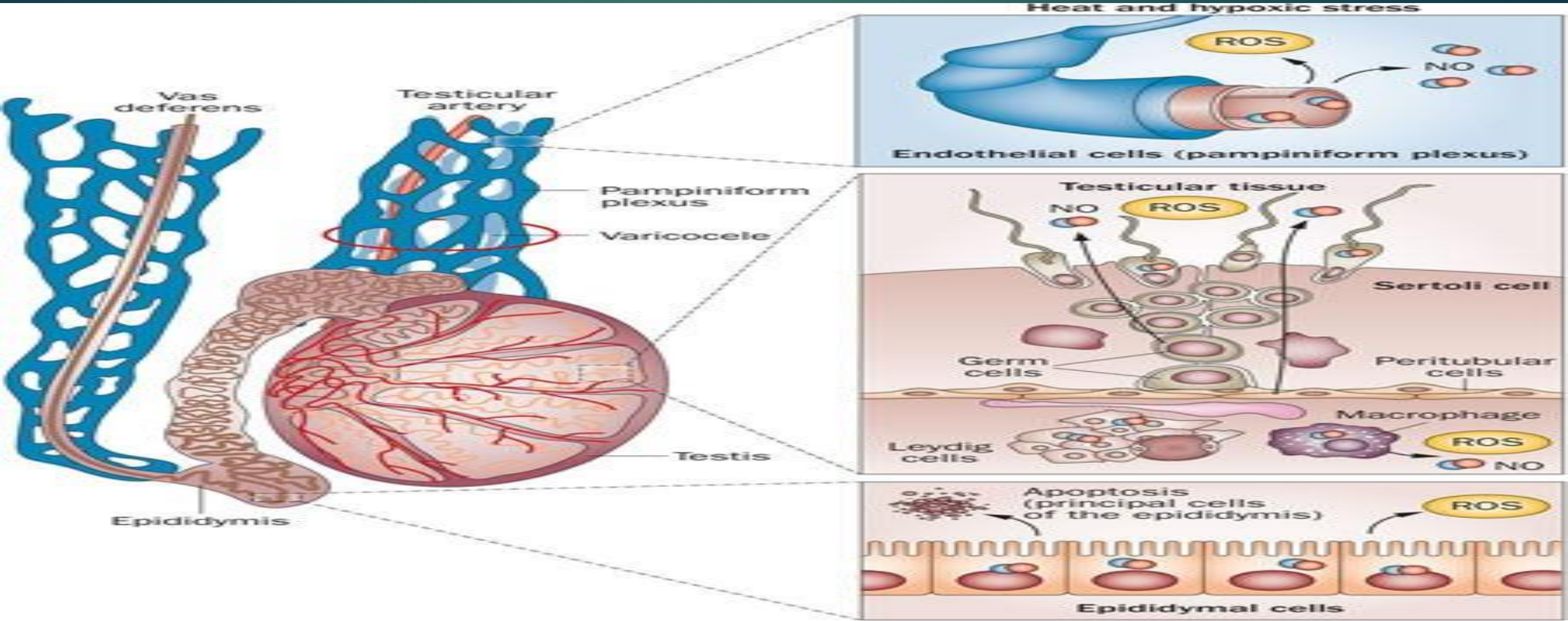
VARICOCELE / ETIOPATHOGENIE

Infertilité Masculine : Varicocèle

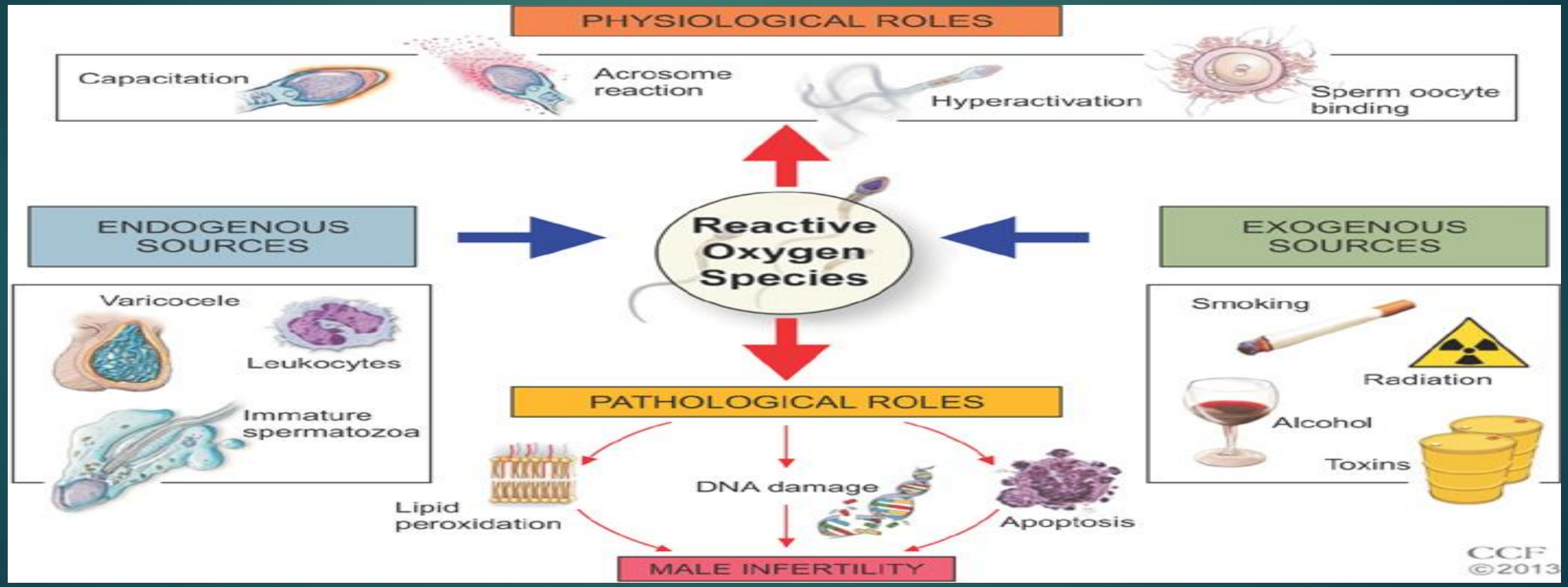
rôle du reflux dans la veine spermatique :

- hyperthermie, hypoxie, reflux toxique rein et surrénale
- hypo spermatogenèse, formes immatures, sclérose de la lamina propria, perte de l'actine et augmentation du Cd^{2+}
- oligo-asthéno-teratospermie

VARICOCELE et SPERMATOGENESE



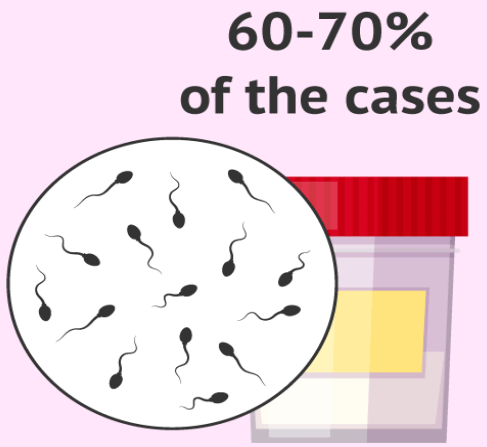
R.O.S et VARICOCELE ?



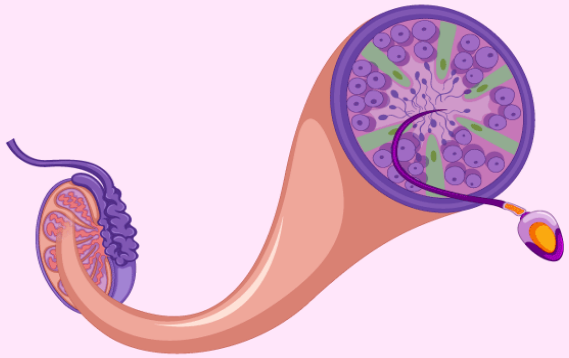
VARICOCELE et A.N.O

- VARICOCELE >>ALTERATION de la fonction secretoire des cellules de LEYDIG: TESTOSTERONEMIE basse .
- Androgenes : régulation fct ç de Sertoli
- Induction des meioses et achevement de la Spgénèse …….AZOO.
- R.O.S en excés …..

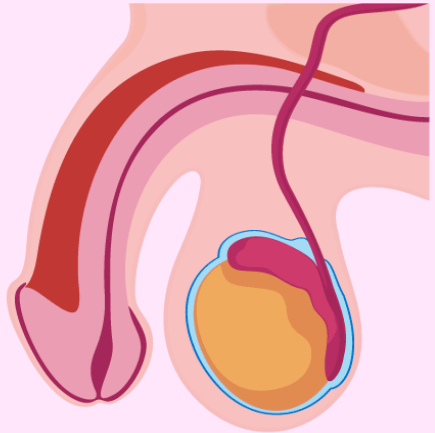
CURE DE VARICOCELE ?



Better semen analysis results



Increase in the spermatogenesis



Reversal of testicular hypertrophy

INFLUENCE DU GRADE DE LA VARICOCELE

Relationship between varicocele size and response to varicocelectomy.

- grade 1--small (22 patients)
- grade 2--medium (44)
- grade 3--large (20)
- Sperm count, per cent motility, per cent tapered forms were measured preoperatively and postoperatively.
- ***Conclusion:*** infertile men with a large varicocele have poorer preoperative semen quality but repair of the large varicocele in those men results in greater improvement than repair of a small or medium sized varicocele.

Goldstein M.J Urol. 1993 Apr;149(4):769-71

VARICOCELE , QUI OPERER ?

Results

Varicocelectomy results in significant improvement in semen analysis in 60% to 80% of men.

Reported pregnancy rates after varicocelectomy vary from 20% to 60%.

Microsurgical varicocelectomy results in return of sperm to the ejaculate in up to 60% of azoospermic men with palpable varicoceles.

Repair of large varicoceles results in a significantly greater improvement in semen quality than repair of small varicoceles.

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REVIEW
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Varicoceles in Men With Non-obstructive Azoospermia: The Dilemma to Operate or Not

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The knowledge on male reproduction is constantly expanding, especially in treating infertility due to non-obstructive azoospermia (NOA). Varicocele is occasionally diagnosed in a subpopulation of males with NOA. Varicocele repair in NOA-men may contribute to the reappearance of spermatozoa in semen. However, spontaneous pregnancies are observed in only a small percentage of NOA-men post-varicocelectomy. Additionally, it has been reported that the repair of varicocele in NOA-men (before the performance of sperm retrieval techniques) may increase the testicular sperm recovery rate. In addition, it increases the pregnancy rate in intracytoplasmic sperm injection (ICSI) programs in NOA-men without spermatozoa in the semen post-varicocelectomy. In addition, to the improvement in Sertoli cellular secretory function, varicocelectomy may increase the secretory function of Leydig cells, which subsequently results in improved androgen production, raising the probability to negate the need for testosterone replacement therapy in cases of late-onset hypogonadism. On the other hand, the benefit of varicocelectomy in patients with NOA is still debatable. The current review study aims to provide a critical and extensive review of varicocele repair in males with NOA. This study additionally focuses on the impact of varicocele repair on sperm retrieval rates and its influence on the ICSI outcomes for those couples who remain negative for spermatozoa in their semen samples post-varicocelectomy.

Keywords: non-obstructive azoospermia, varicocele, varicocelectomy, ICSI, spermatozoa

OPEN ACCESS

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INTRODUCTION

Male infertility treatment has significantly progressed recently. The intracytoplasmic sperm injection (ICSI) allowed overcoming difficulties in cases of a small number of functional spermatozoa in semen samples (1). Non-obstructive azoospermia (NOA) is one of the most challenging causes of male infertility to treat. It is described as the absence of spermatozoa in the microscopic evaluation of the semen sample observing the pellets of two semen samples post-centrifugation (2, 3).

Azoospermia affects 1% of the male population and 10–15% of a subpopulation of infertile men. Azoospermia is classified into obstructive azoospermia

A.N.O et VARICOCELE ?

Is the Effect Durable?

- 27 azoospermia microsurgical varicocelectomy
- Induction of spermatogenesis was achieved in nine men (33.3%)
- Sperm conc 1.2 x 10(6)/mL to 8.9 x 10(6)/mL
- Motility 24% to 75.7%,
- One patient with maturation arrest established pregnancy
- *Five relapsed into azoospermia 6 months after the recovery of spermatogenesis*

Pasqualotto FF, Fertil Steril. 2006 Mar;85(3):635-9.

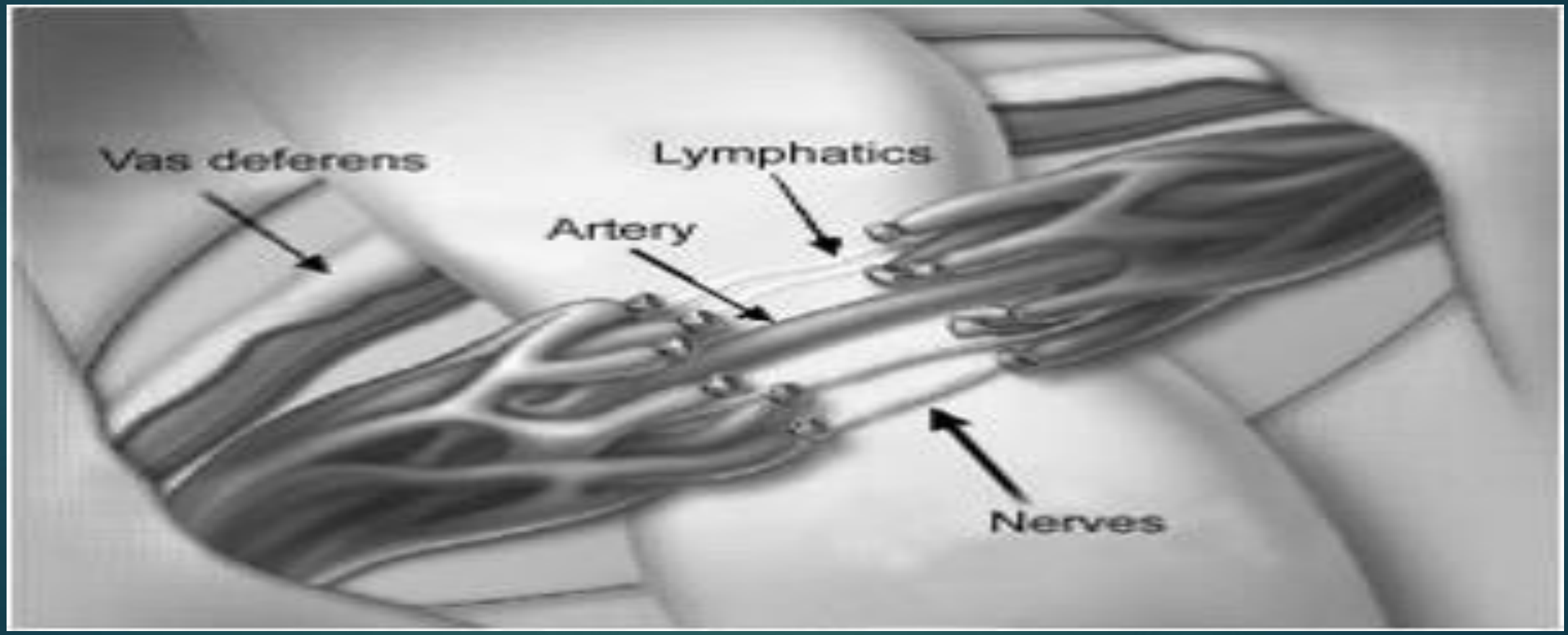
Cure de Varicocele et N.O.A

- Esteves , Miyaoka,Roque, Agarwal ,(Asian J Androl 2016)

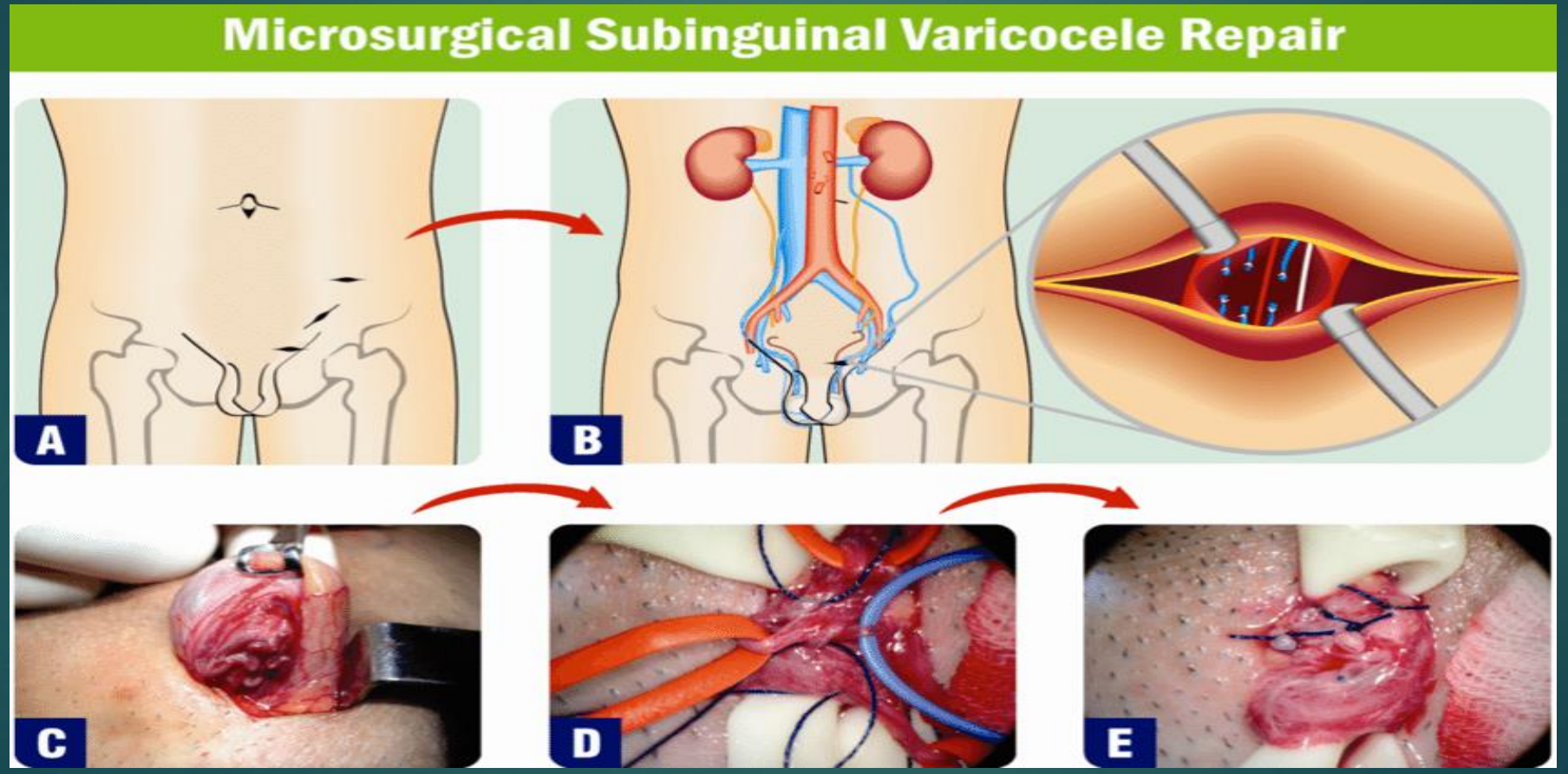
Men with NOA and clinical varicocele may benefit from varicocelectomy

x2,6 TESE positive , améliore les résultats ICSI permet de retrouver des Spz/ éjaculat .

QUELLE TECHNIQUE ??



QUELLE TECHNIQUE ??



ORIGINAL RESEARCH
Andrology

Doi: 10.4274/jus.galenos.2018.2333
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Effect of Varicocelectomy on Restoration of Spermatogenesis in Patients with Non-obstructive Azoospermia

Non-obstruktif Azoospermik Erkeklerde Varikoselektominin Spermatogenez Restorasyonuna Etkisi

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What's known on the subject? and What does the study add?

The efficiency of varicocelectomy is one of the challenging subject for patients with non-onbstructive azoospermia. In this study, testicular volume and free testosterone levels were found to be predictive factors for recovery of spermatogenesis after varicocelectomy even tough they have a weak association.

Abstract

Objective: The aim of this study was to investigate the effect of varicocelectomy on spermatogenesis in patients with non-obstructive azoospermia (NOA) and the presence of clinical factors for re-spermatogenesis.

Materials and Methods: A total of 32 patients with clinically significant varicocele, who received the diagnosis of infertility, were included in this study. Microsurgical inguinal varicocelectomy and testicular biopsy were performed in all patients. After varicocelectomy, control spermiogram samples were collected from patients at 3rd, 6th and 12th months. The role of age, testicular volume, hormone parameters and pathological findings in predicting re-spermatogenesis were investigated.

Results: The mean age of the patients who underwent surgery was 31.4±6.2 years. After varicocelectomy, sperm was detected in semen in 15.6% (5/32) of the patients. As a result of pathological evaluation, hypospermatogenesis, maturation arrest and germ cell aplasia were found in 34.4%, 31.2% and 34.4% of patients, respectively. The testicular volume was higher in patients with re-spermatogenesis (p=0,01). There was no statistically significant difference between responders and non-responders in terms of other investigated parameters.

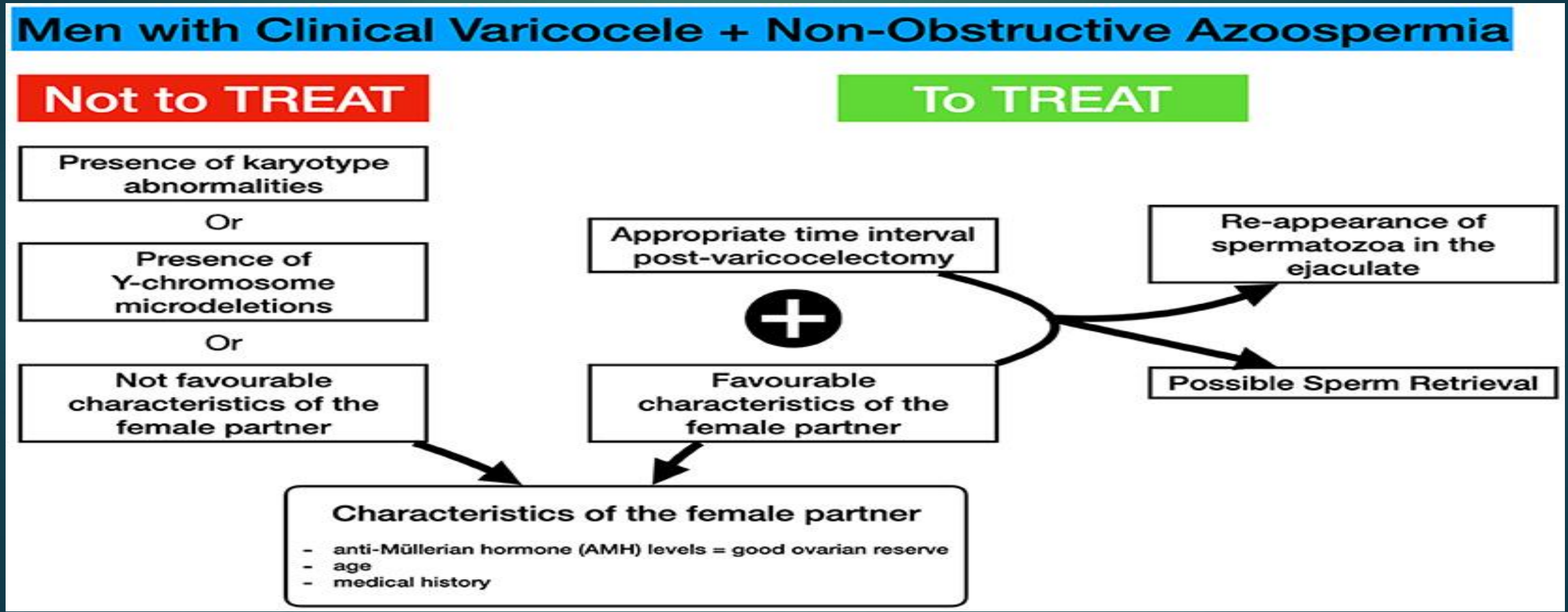
Conclusion: Varicocelectomy is an acceptable modality of treatment for patients with NOA with clinically significant varicocele. On the other hand, appropriate patient selection is crucial. In this study, testicular volume was found to be a predictive factor for recovery of spermatogenesis after varicocelectomy.

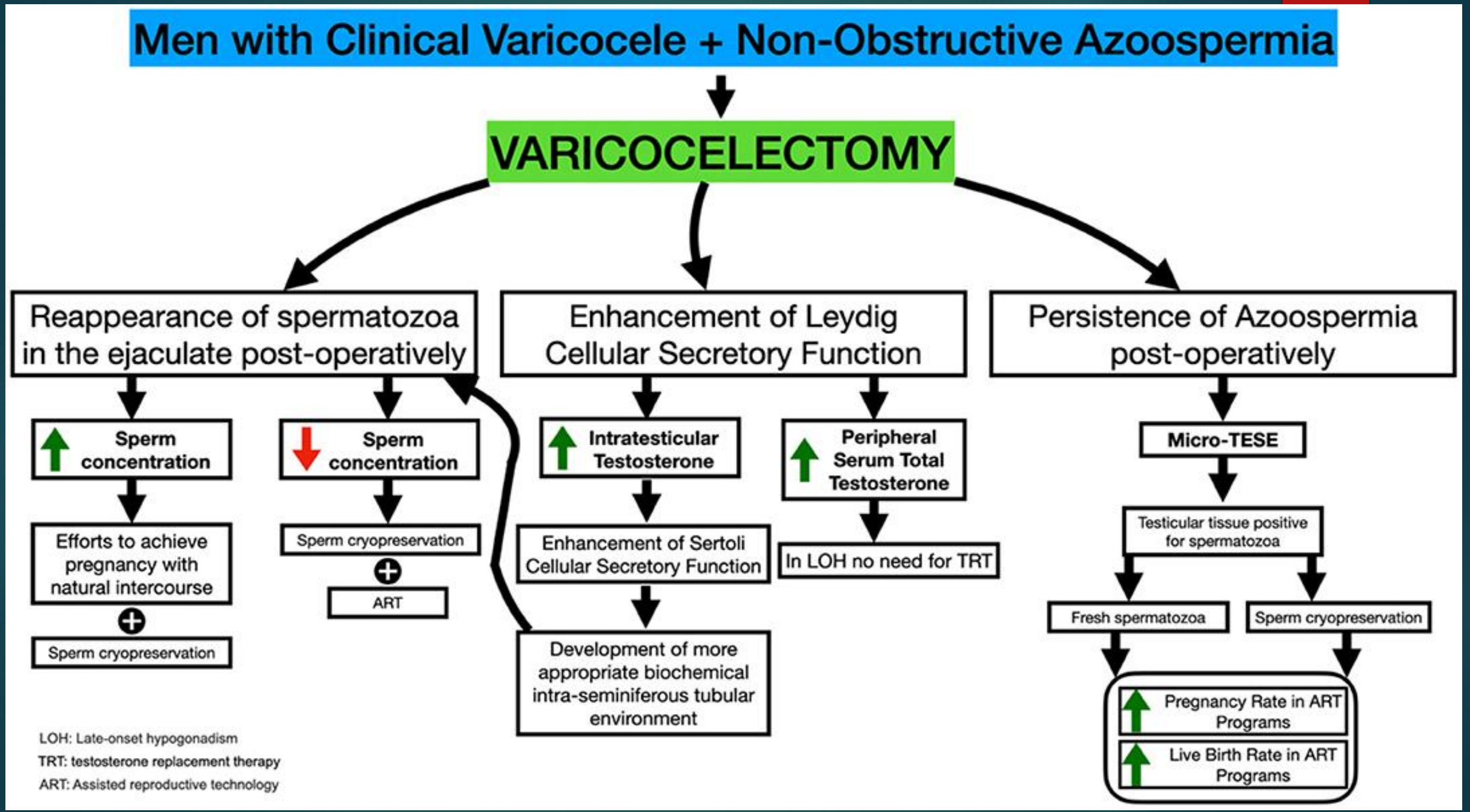
Keywords: Infertilty, Non-obstructive azospermia, Varicocelectomy

VARICOCELECTOMIE et A.N.O

References	No. of patients	Procedure approach	Presence of sperm in postoperative ejaculate		Azoospermia relapse	Sperm retrieval		Pregnancy rates	
			No. (%) of patients with motile sperm	Total no. of motile sperm (x 10^6)		SRR	Histopathology	Natural	With ART
Matthew et al. (7)	22	Microsurgical varicocelectomy	12/22 (55%)	2.2 ± 1.1	–	–	–	2/22 (9%)	1/22 (5%)
Kim et al. (96)	28	Varicocelectomy inguinal	12/28 (43%)	1.2 ± 3.6	2/12 (17%)	–	HYPO: 18, MA: 13, SCO: 3	–	2/28 (7%)
Kadioglu et al. (45)	24	Microsurgical varicocelectomy	5/24 (21%)	0.04±0.03	–	–	HYPO:3, MA: 14, SCO: 7	0/24 (0%)	–
Schlegel et al. (48)	31	Microsurgical varicocelectomy	7/31 (22%)	–	4/7 (57%)	–	–	0/31 (0%)	–
Giannakiset al. (54)	22	Microsurgery subinguinal	6/22 (27%)	2	–	–	–	–	–
Cakanet al. (46)	13	Varicocelectomy inguinal	3/13 (23%)	0.7	0/13 (0%)	–	HYPO: 5, MA: 3, SCO: 5	0/13 (0%)	–
Esteves et al. (97)	17	Microsurgery inguinal	6/17 (35%)	0.8	–	4/9 (44.4%)	HYPO: 6, MA: 5, SCO: 6	1/17 (6%)	–
Gat et al. (98)	32	Percutaneous embolization	18/32 (56%)	3.8	7/18 (39%)	–	–	4/32 (13%)	5/32 (16%)
Pasqualotto et al. (58)	27	Microsurgery subinguinal	9/27 (33%)	0.87 ± 1.74	7/9 (78%)	–	HYPO: 9, MA: 8, SCO: 10	1/9 (11%)	–
Poulakis et al. (99)	14	Anterograde sclerotherapy	7/14 (50%)	3.1 ± 1.2	–	–	HYPO: 4, MA: 5, SCO: 3	2/14 (14%)	–
Lee et al. (5)	19	Microsurgery inguinal	7/19 (37%)	0.36	2/7 (29%)	–	HYPO: 3, MA: 6, SCO: 10	1/19 (5%)	–
Ishikawa et al. (100)	6	Microsurgery inguinal	2/6 (33%)	0.2	–	–	–	0/6 (0%)	–
Youssef et al. (101)	54	High ligation	14/54 (26%)	3.56 ± 4.8	–	–			–
Cocuzza et al. (102)	10	Microsurgery subinguinal	3/10 (30%)	5.5	–	–	HYPO: 2, MA: 4, SCO: 4	–	–
Inciet al. (62)	66	Microsurgical varicocelectomy	–	–	–	35/66 (53%)	–	–	11/66 (17%)
Haydardedeoglu et al. (63)	74	Macrosurgical varicocelectomy	–	–	–	45/74 (60.8%)	–	–	23/74 (31%)
Abdel-Meguid et al. (79)	31	Microsurgery subinguinal	9/31 (29%)	2.3 ± 1.7	2/9 (22%)	10/31 (32%)	HYPO: 13, MA: 6, SCO: 2	–	–
Kiracet al. (103)	23	Microsurgery subinguinal	7/23 (30%)	1.34	–	–	–	1/23 (4%)	2/23 (9%)
Zampieriet al. (64)	35	Varicocelectomy	17/35 (49%)	0.6	–	15/35 (43%)	–	0/35 (0%)	0/35 (0%)
Aboutaleb et al. (42)	20	Loupe-assisted subinguinal	6/20 (30%)	2	–	–	HYPO: 7, MA: 3, SCO: 10	–	–
D'Andrea et al. (104)	23	Embolization	11/23 (48%)	1.3	–	–	–	–	–
Ustuneret al. (59)	19	Microsurgery subinguinal	1/19 (5%)	–	–	8/19 (42%)	HYPO: 2, MA: 3, SCO: 14	–	–
Shiraishiet al. (51)	83	Microsurgery inguinal	20/83 (24%)	7.8	–	30/83 (36%)	HYPO: 13, MA: 27, SCO: 43	–	5/83 (6%)
Sajadiet al. (56)	57	Microsurgical varicocelectomy	8/57 (14%)	–	–	14/38 (37%)	HYPO: 3, MA: 8, SCO: 3	1/57 (2%)	1/57 (2%)
Elbardisiet al. (105)	42	Microsurgical varicocelectomy	11/42 (26%)	1.98 ± 5.4	0/11 (0%)	–	HYPO: 8, MA: 0, SCO: 3	–	–
Birowoet al. (60)	42	Microsurgery subinguinal	29/42 (69%)	–	–	–	HYPO: 0, MA: 42, SCO: 0	–	–

VARICOCELE ET A.N.O ?




Men with Clinical Varicocele + Non-Obstructive Azoospermia
VARICOCELECTOMY
Reappearance of spermatozoa in the ejaculate post-operatively
Enhancement of Leydig Cellular Secretory Function
Persistence of Azoospermia post-operatively
Sperm concentration
Efforts to achieve pregnancy with natural intercourse
Sperm cryopreservation
Sperm concentration
Sperm cryopreservation
ART
Intratesticular Testosterone
Enhancement of Sertoli Cellular Secretory Function
Development of more appropriate biochemical intra-seminiferous tubular environment
Peripheral Serum Total Testosterone
In LOH no need for TRT
Micro-TESE
Testicular tissue positive for spermatozoa
Fresh spermatozoa
Sperm cryopreservation
Pregnancy Rate in ART Programs
Live Birth Rate in ART Programs
LOH: Late-onset hypogonadism
TRT: testosterone replacement therapy
ART: Assisted reproductive technology

conclusions

- Effet favorable de la varicocelectomie sur l'ANO en terme de Spgenèse et de réapparition de Spz mobiles/ éjaculat .
- Amélioration du rendement /TESE chez les patients qui restent azoospermes .
- Risques de rechute /Azoo >>Congelation !
- Taux de G vivantes après ICSI + élevé .
- Prise en charge de l' azoospermie / Urologue en collaboration avec un centre de PMA+++++++

TAKE HOME MESSAGE …….

- CURE DE VARICOCELE / A.N.O :effet bénéfique sur Spermatogenèse et apparition de SPZ mobiles dans l'éjaculat . Si l'ANO persiste le rendement de la TESE sera meilleur .
- Réapparition de SPZ parfois transitoire >>>>>>CONGELATION !!!!!!

- HISTOPATHOLOGIE TESTICULAIRE : marqueur pronostic +++++++

- HYPOSPERMATOGENESE > ARRET DE MATURATION > SERTOLI CELL ONLY .

A.N.O et VARICOCELE : LE VOLUME TESTICULAIRE EST EGALEMENT UN ELEMENT PREDICTIF DE REPRISE DE SPERMATOGENESE.

MERCI……