# O papel dos Exames Imagiológicos no estudo da Infertilidade Masculina

LILIAN CAMPOS

# CONSULTA DE INFERTILIDADE

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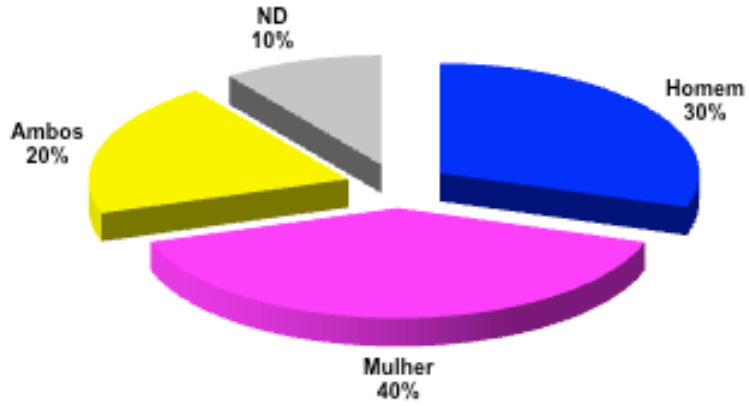
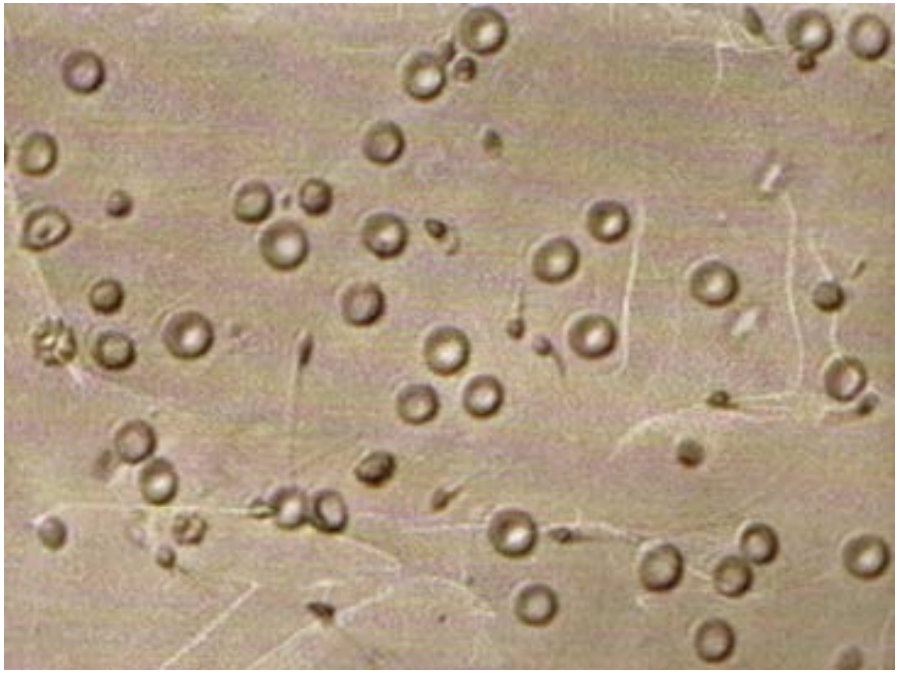
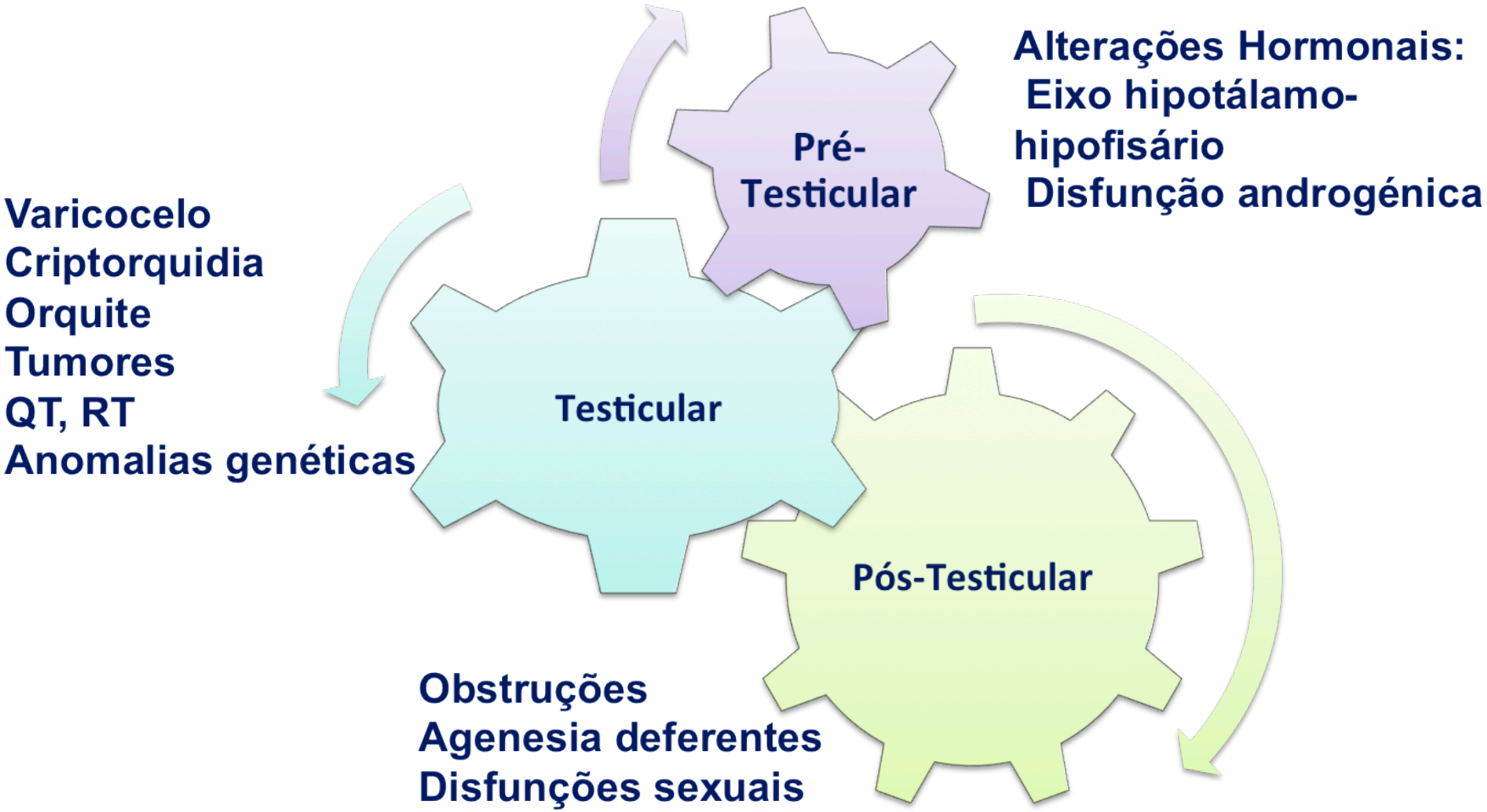



# HISTÓRIA CLÍNICA E EXAME OBJECTIVO

# ESPERMOGRAMA



# CAUSAS DE INFERTILIDADE MASCULINA



**RMN cerebral**

**Ecografia escrotal**
**Flebografia espermática**

Varicocelo
Criptorquidia
Orquite
Tumores
QT, RT
Anomalias genéticas


Alterações Hormonais:
Eixo hipotálamo-hipofisário
Disfunção androgénica

Obstruções
Agenesia deferentes
Disfunções sexuais

**Ecografia prostática**
**RMN endorectal**
**Deferentografia**

# EXAMES IMAGIOLÓGICOS NA INFERTILIDADE MASCULINA

## ECOGRAFIA

- Escrotal
- Prostática
- Abdominal

## RMN

- Cerebral
- Endorectal e Pélvica

## ESTUDOS CONTRASTADOS

- Flebografia espermática
- Deferentografia
- Vesiculografia seminal

# EXAMES IMAGIOLÓGICOS NA INFERTILIDADE MASCULINA

## ECOGRAFIA

- Escrotal
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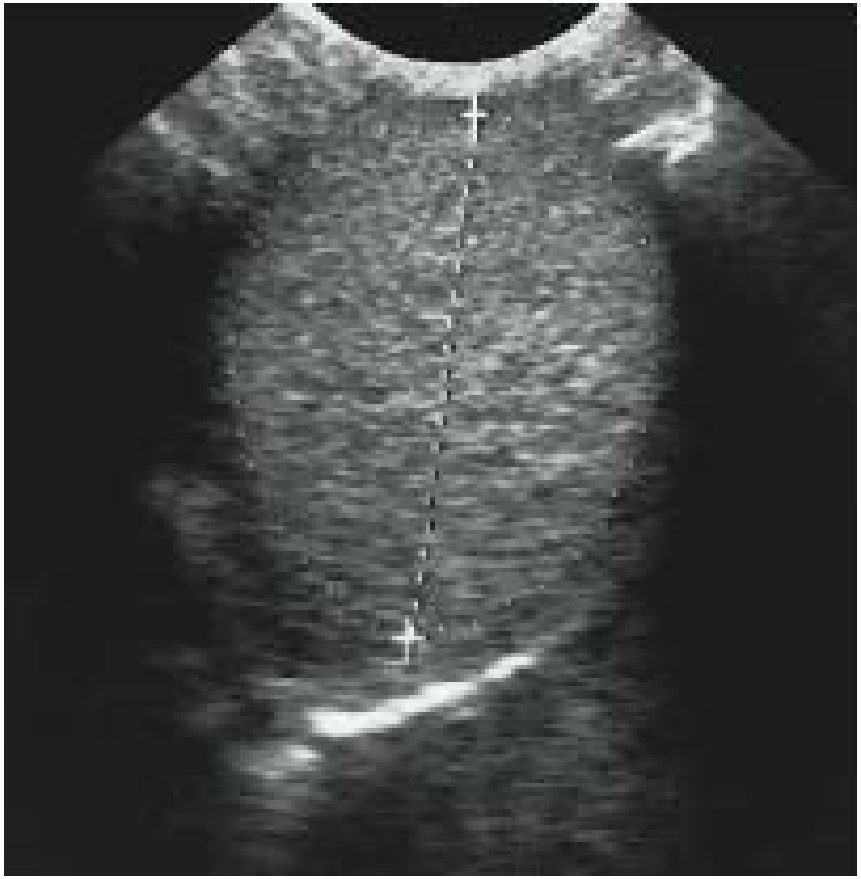
# ECOGRAFIA ESCROTAL



**Avaliação:**

- **Parênquima testicular**
- **Estruturas paratesticulares**
- **Fluxo sanguíneo testicular**
- **Guiar TESE**

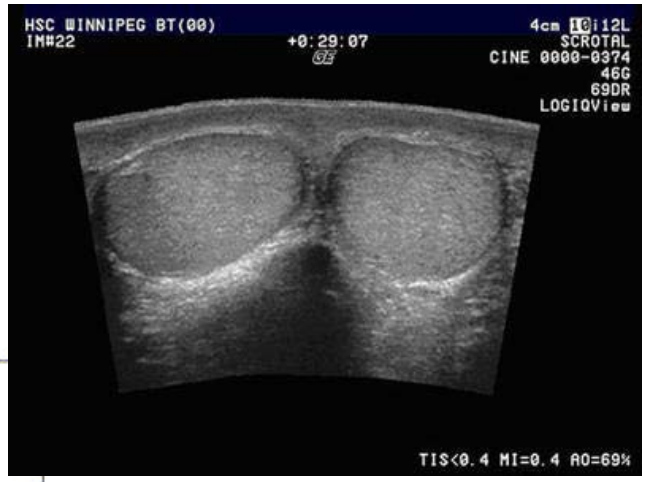
# DIAGNÓSTICOS CLÍNICOS EM DOENTES SUBMETIDOS A TESE 2004 – 2011 (n= 137)

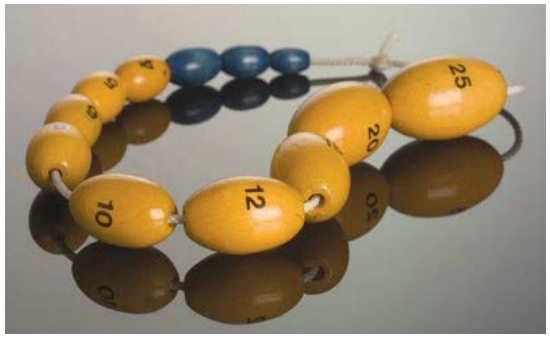
| | | |
|---|---|---|
| Criptorquidia | 8 | 5,8% |
| Varicocelo | 21 | 15,3% |
| Infecções urogenitais | 3 | 2,2% |
| Alterações cromossómicas ex(.: 47,XXY) | 6 | 4,4% |
| Micro-delecções Y | 6 | 4,4% |
| Neoplasias (testiculares e não testiculares) | 9 | 6,6% |
| Doença endócrina ou outra (ex.: DM, LES, TVM) | 9 | 6,6% |
| Hipogonadismo hipogonadotrófico | 3 | 2,2% |
| Antecedentes de vasectomia | 1 | 0,7% |
| Fibrose quística | 1 | 0,7% |
| Idiopático | 70 | 51,1% |

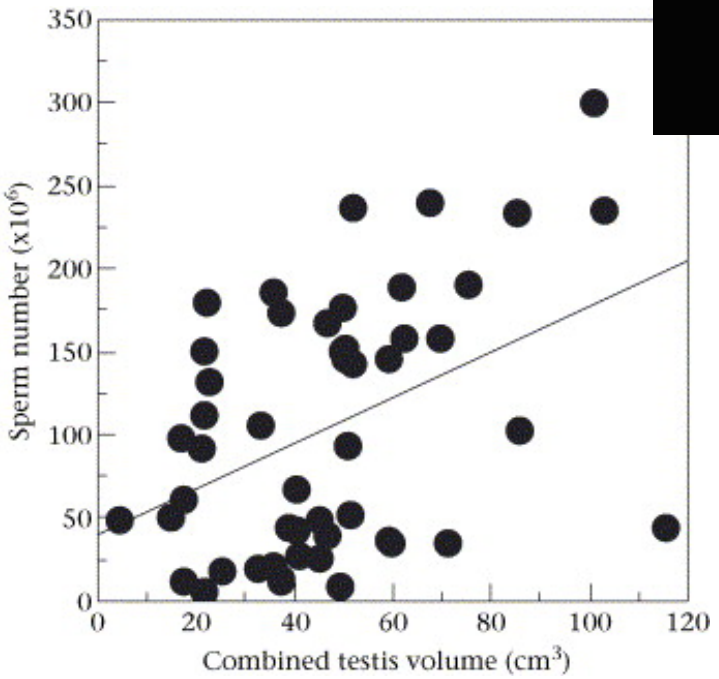
L Campos, B Parada, T Almeida Santos *et al* (2012)

# Volume Testicular

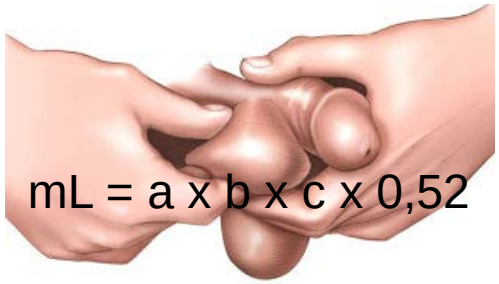
cut-point = 15mL (both testicles)



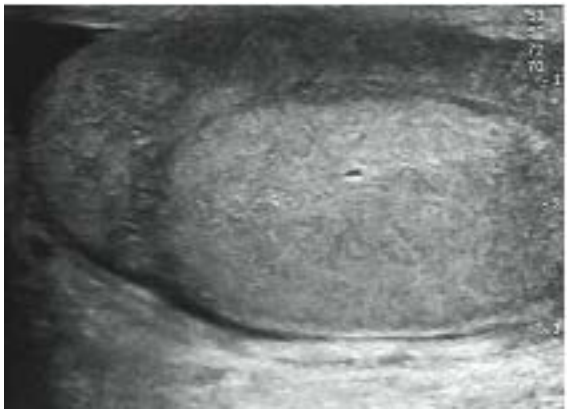



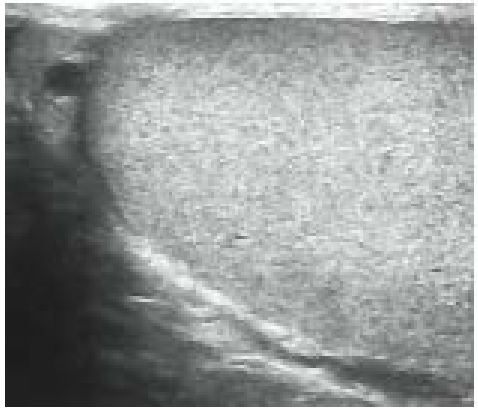

Leigh *et al*. Anim Behav 2004.

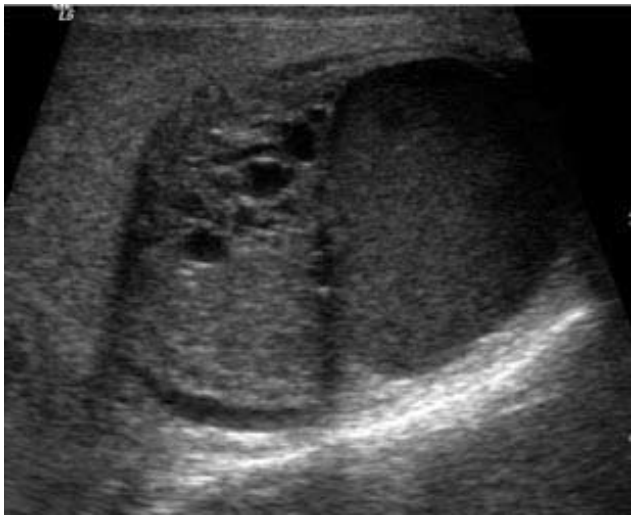


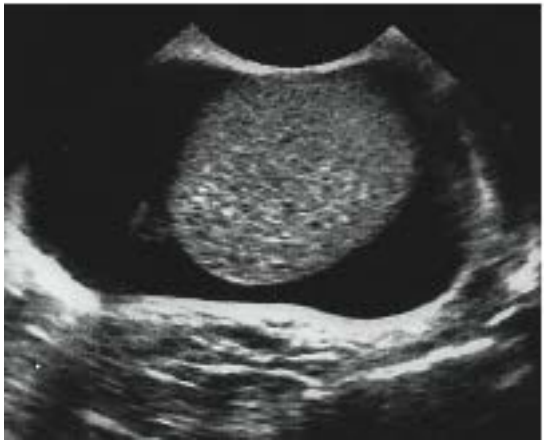
mL = a x b x c x 0,52

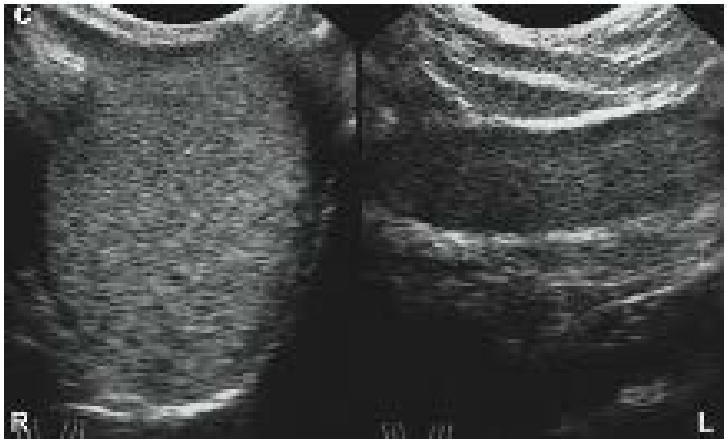
# Detalhes Anatómicos



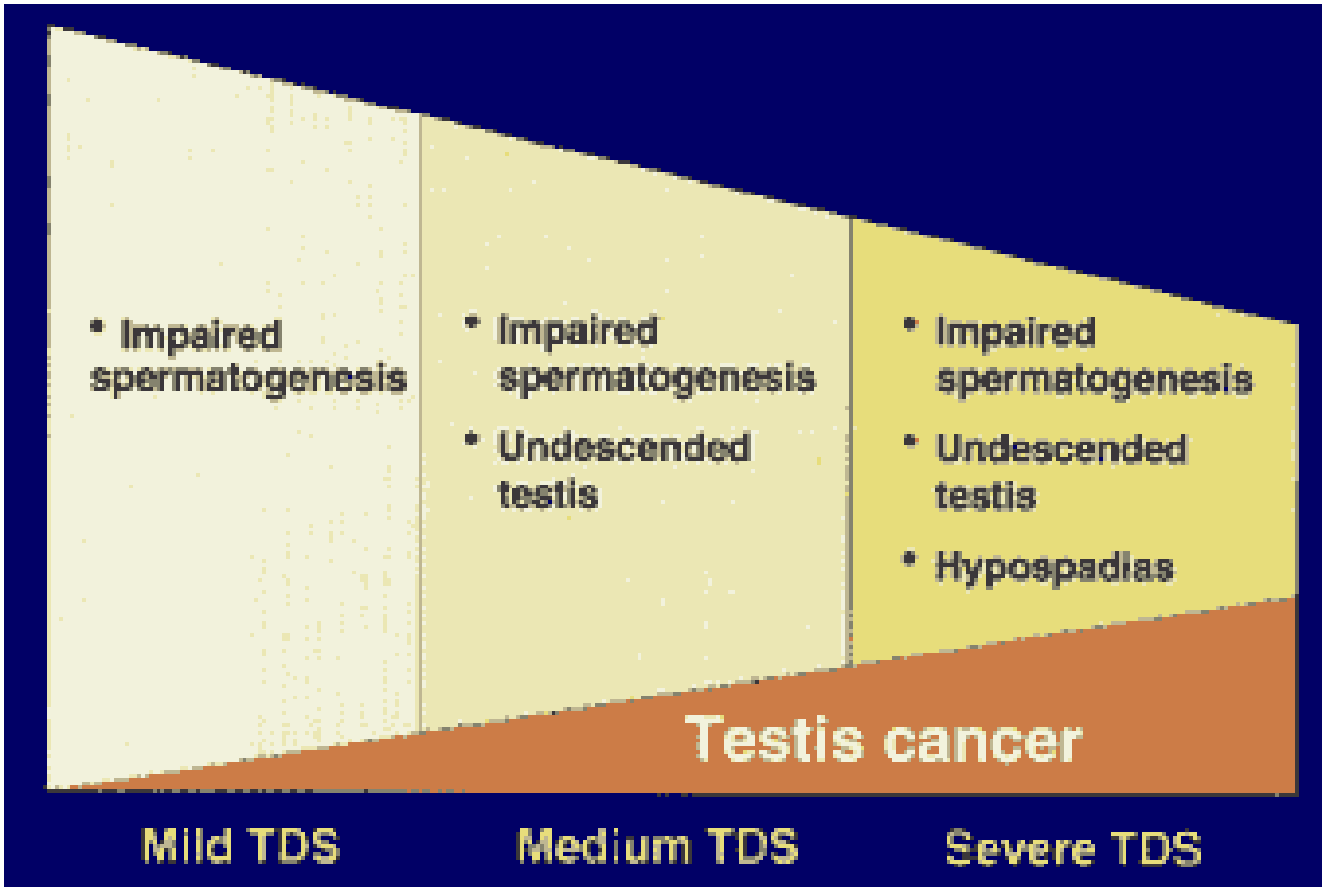








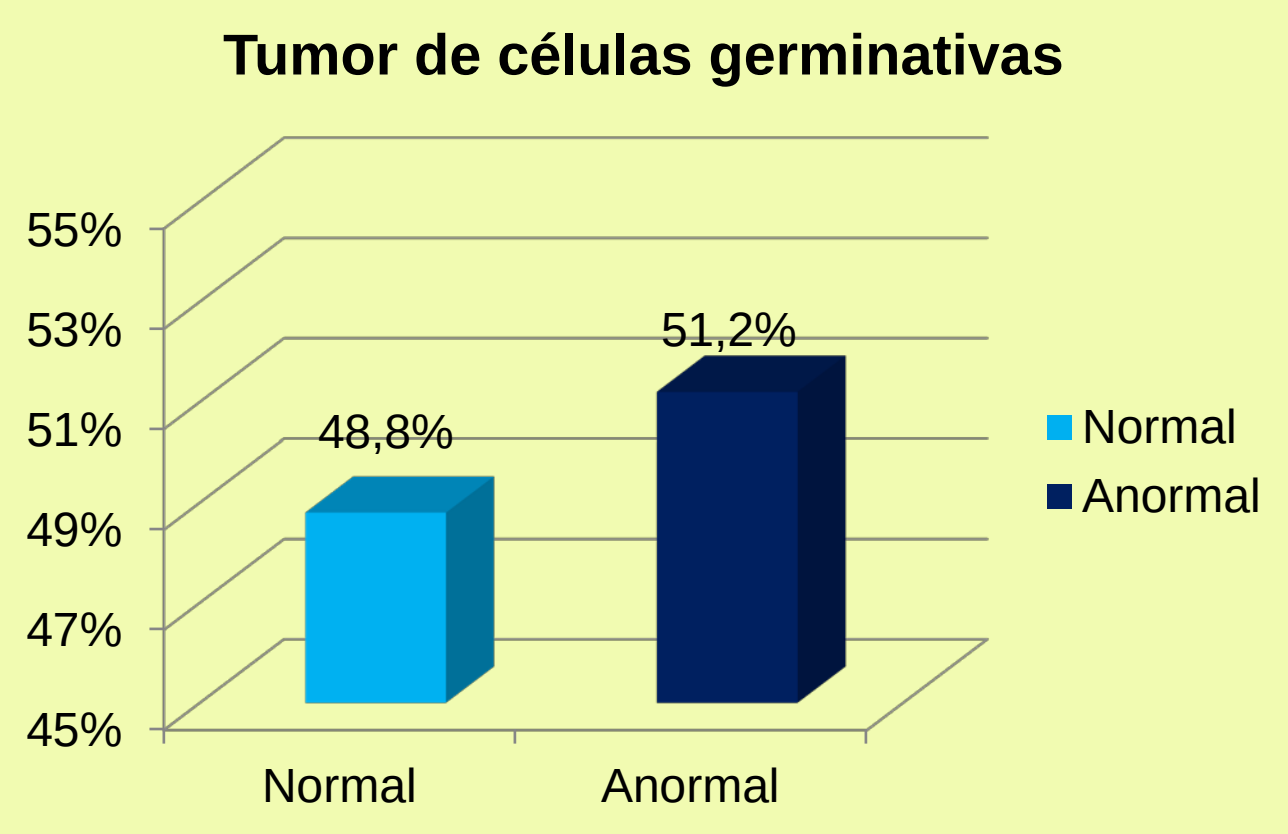
# Síndrome de Disgenesia Testicular




Skakkebæk *et al.* Hum Reprod 2001.

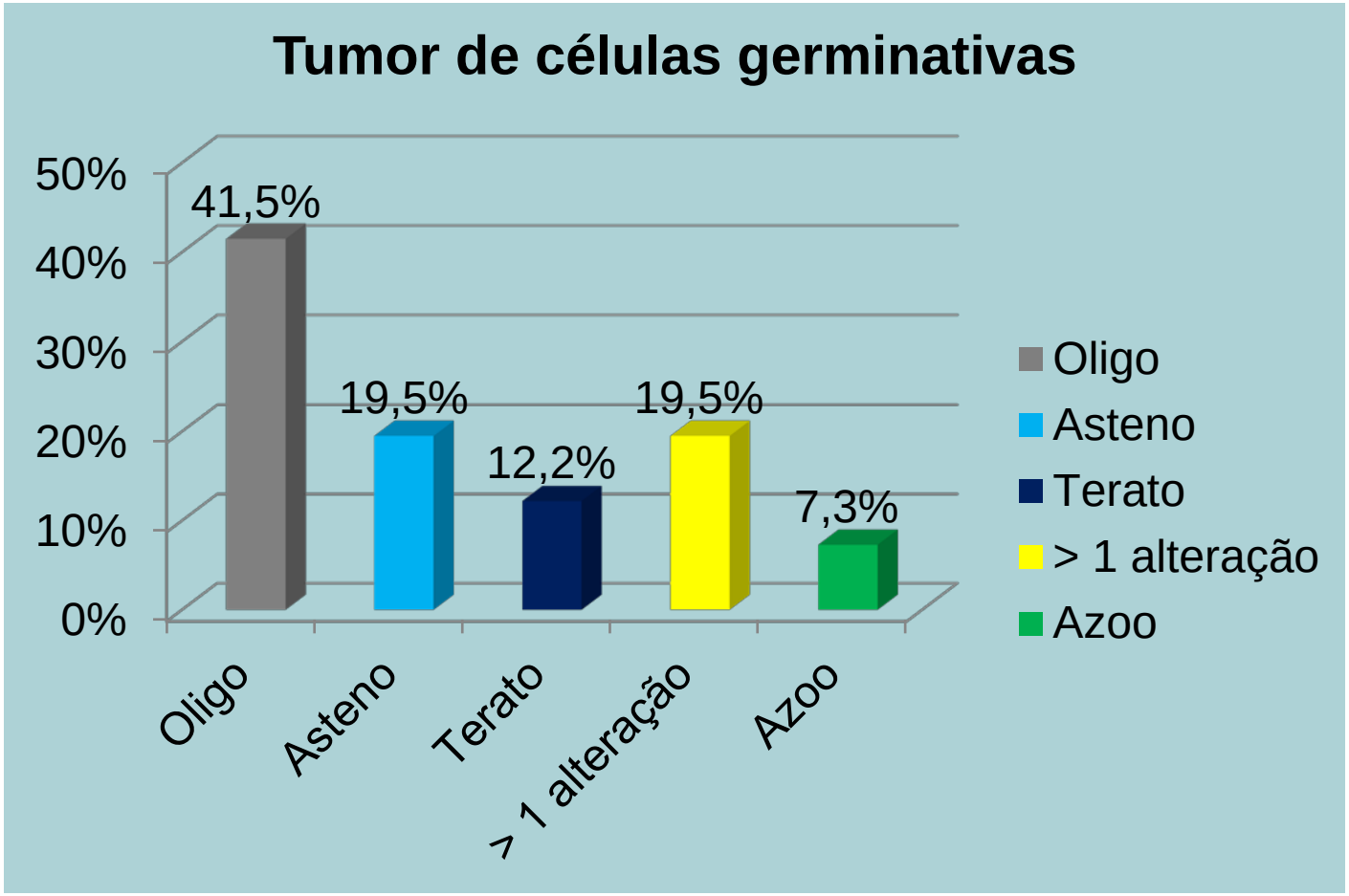
# Sub-fertilidade e neoplasia germinativa do testículo como manifestações do síndrome de disgenesia testicular

Jan 1990 – Dez 2011
n= 123 casos




L Campos, T Almeida Santos, B Parada *et al* (2013)

# Sub-fertilidade e neoplasia germinativa do testículo como manifestações do síndrome de disgenesia testicular

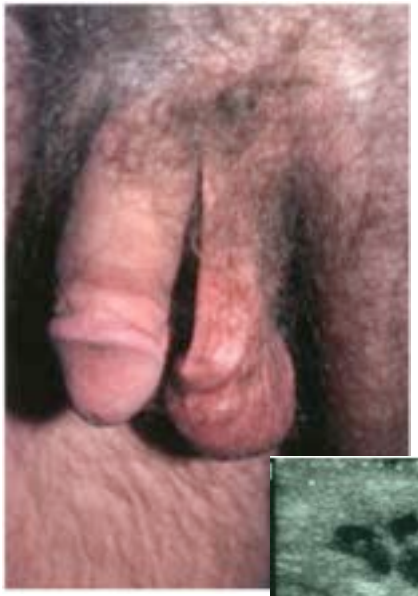


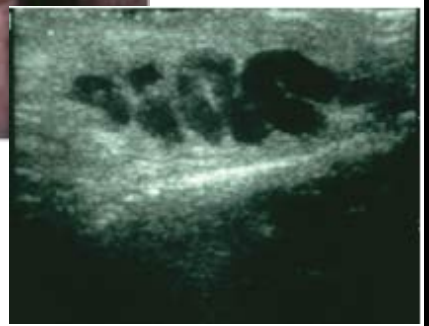

L Campos, T Almeida Santos, B Parada *et al* (2013)

# Varicocelo

*“...veias dilatadas e enroladas sobre o testículo, que se torna mais pequeno que o seu companheiro.”*
*De medicina*
*Celsus 30 d.C.*

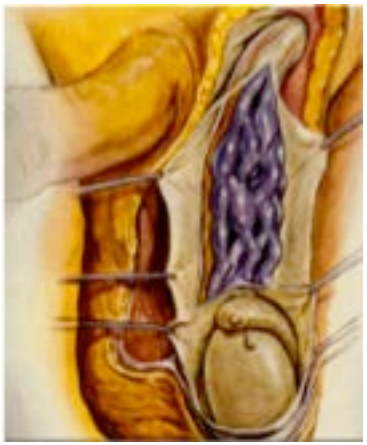
CLASSIFICAÇÃO:
**Sub-clínico:** não detectável clinicamente
**Grau I:** palpável apenas durante a manobra de Valsalva
**Grau II:** palpável em repouso
**Grau III:** visível em repouso



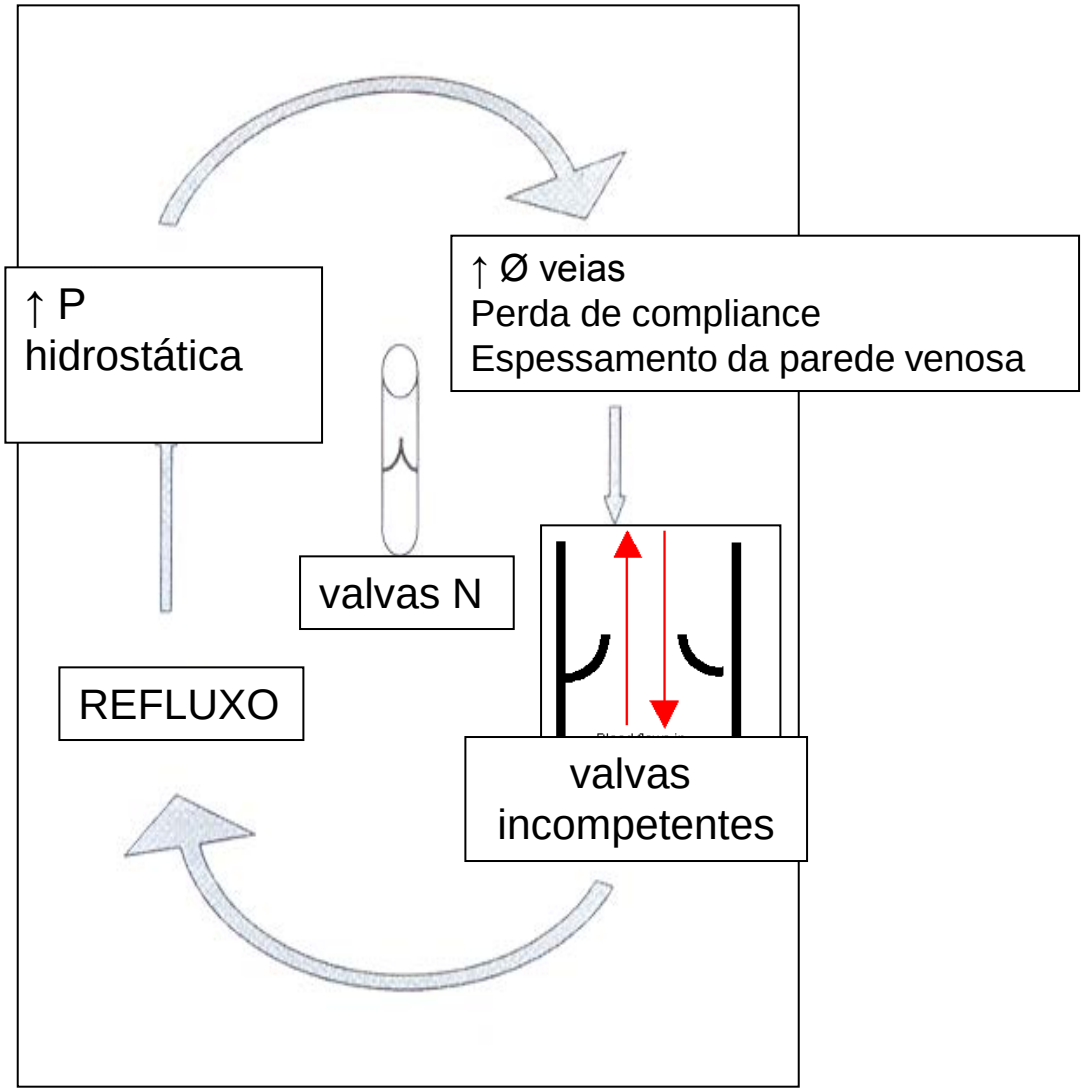


- 78-93% à esquerda
- Diagnóstico: clínico e Eco-Doppler escrotal

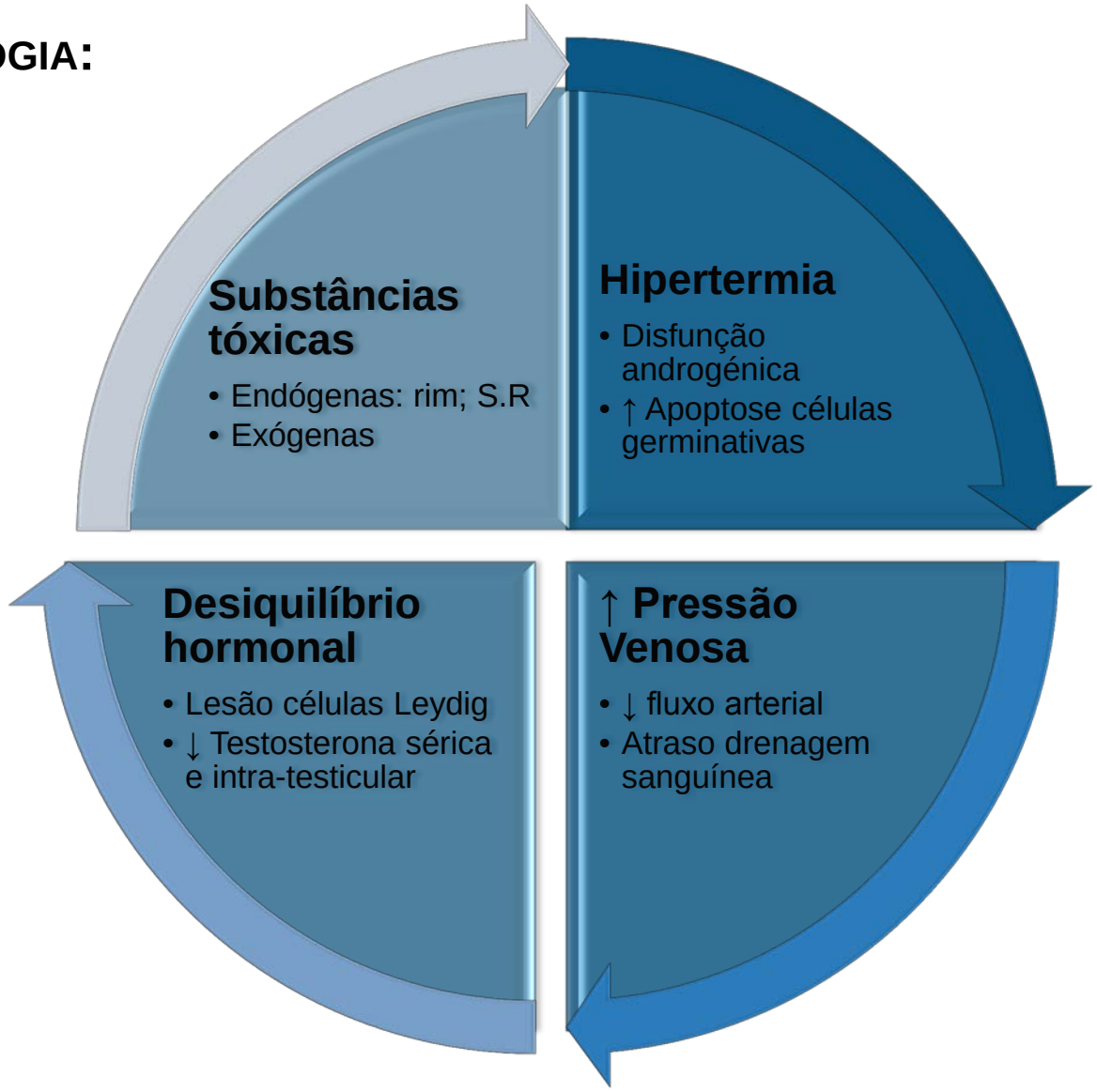
## ETIOLOGIA:



✓ 90% à esquerda: conceitos anatómicos
Anatomia da veia espermática esquerda
Veia renal esquerda (aorta e ms)
Posição ortostática



# FISIOPATOLOGIA:

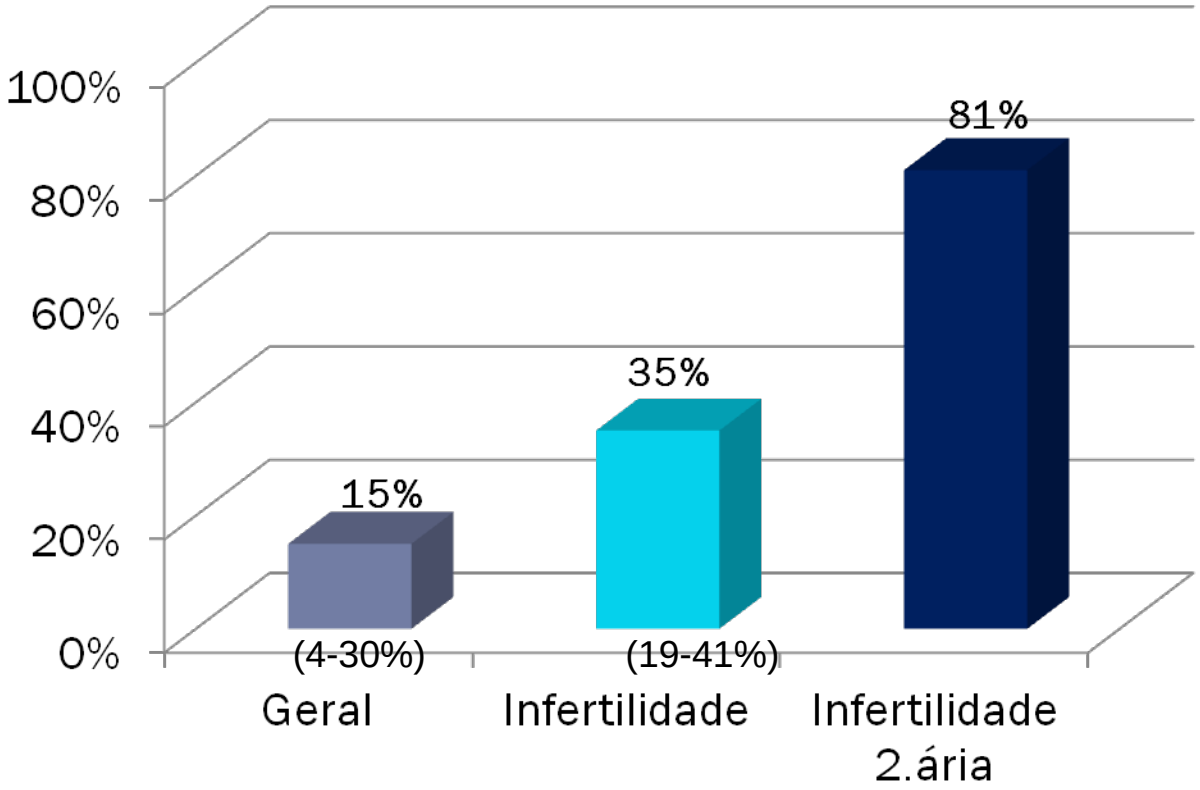



Eisenberg, M. L. and L. I. Lipshultz (2011). "Varicocele-induced infertility: Newer insights into its pathophysiology." Indian J Urol **27(1): 58-64.**

Shiraishi, K., H. Matsuyama and H. Takihara (2012). "Pathophysiology of varicocele in male infertility in the era of assisted reproductive technology." Int J Urol **19(6): 538-550.**

## PREVALÊNCIA:

## Em função da população estudada

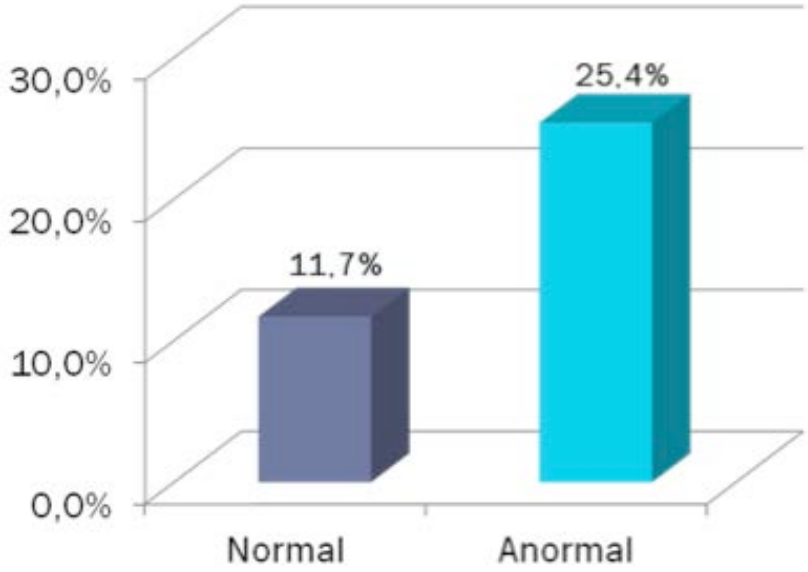



Baazeem, A., et al (2011). "Varicocele and male factor infertility treatment: a new meta-analysis and review of the role of varicocele repair." Eur Urol **60(4): 796-808.**

Naughton CK, Nangia AK, Agarwal A. Pathophysiology of varicoceles in male infertility. Hum Reprod Update. 2001;7:473–81.

## PREVALÊNCIA:

## Em função dos parâmetros seminais




✓**Oligoastenoteratozoospermia (OAT)**

***"Varicocele is clearly associated with impairment of testicular function and infertility"***

Fertil Steril 1992 Jun;57(6):1289-93. The influence of varicocele on parameters of fertility in a large group of men presenting to infertility clinics. World Health Organization.

## Resposta ao Tratamento

Cochrane Database Syst Rev **2009** Jan 21;(1):
**Surgery or embolisation for varicoceles in subfertile men.**
Evers JH, Collins J, Clarke J

Odds ratio of the eight studies is **1.10** (95%CI 0.73 to 1.68)

**AUTHORS' CONCLUSIONS:**

***There is no evidence that treatment of varicoceles*** *in men from couples with otherwise unexplained subfertility* ***improves the couple's chance of conception.***

## Resposta ao Tratamento

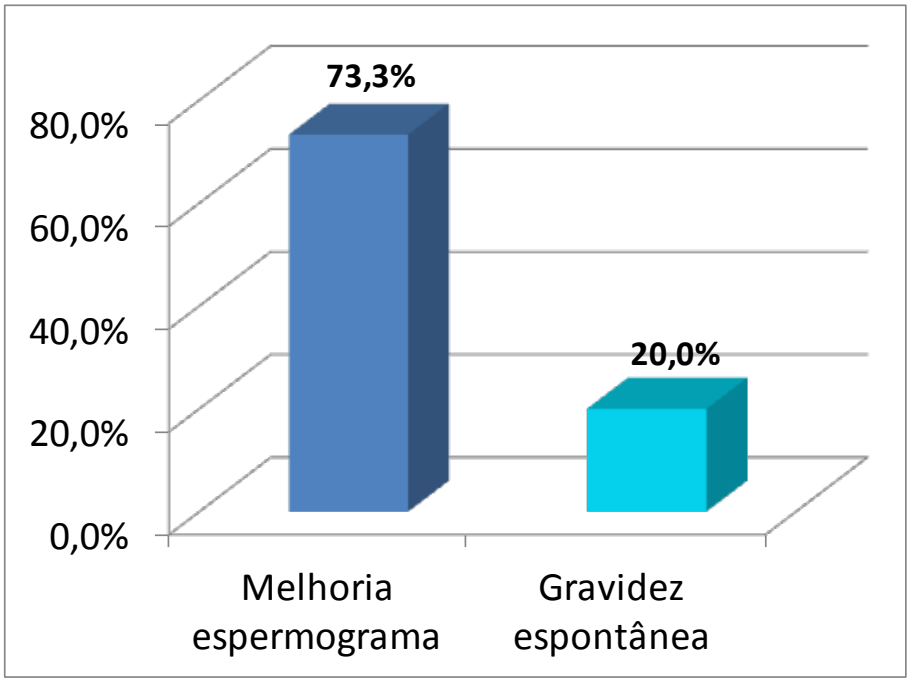
Cochrane Database Syst Rev **2012** Oct 17;(10):
**Surgery or embolisation for varicoceles in subfertile men.**
Kroese AC, de Lange NM, Collins J, Evers JH

abnormal semen analysis …The outcome favoured treatment, with a combined **OR 2.39** (95% CI 1.56 to 3.66)

**AUTHORS' CONCLUSIONS:**

*There is evidence suggesting that **treatment of a varicocele** in men from couples with otherwise unexplained subfertility **may improve a couple's chance of pregnancy.***

# Resposta ao Tratamento




**Jan 2000 – Dez 2009**

**n = 50**

Eufrásio P, Parada B et al (2012)

# "Varicocele repair for infertility: what is the evidence?"

Current Opinion in Urology

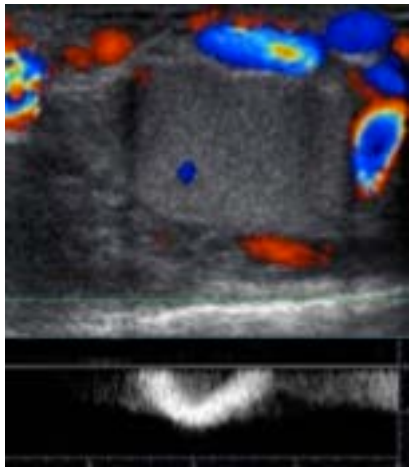
• *Varicocele repair must be proposed in young adult men with impairment of seminal parameters and not yet interested in pregnancy.*

• *Men of infertile couples should be adequately counselled concerning the high possibility of attaining a significant improvement in seminal parameters after varicocele repair.*

•*This condition* ***can be associated with a spontaneous pregnancy rate of 30%.***

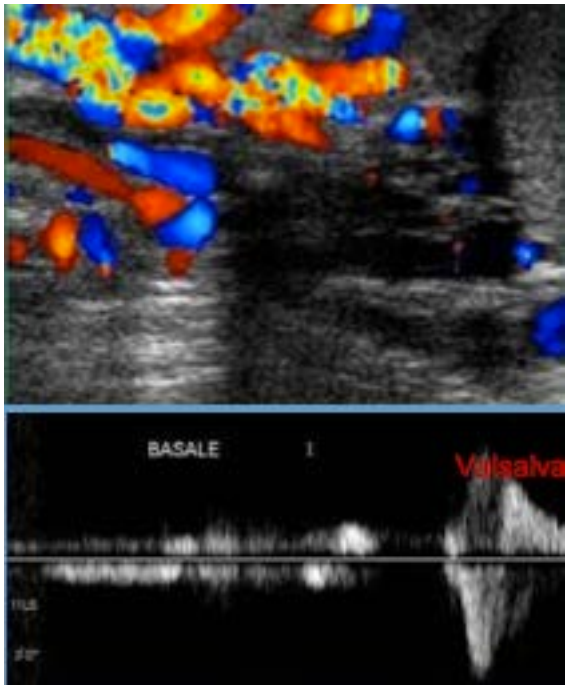
Ficarra, V., A. Crestani, G. Novara and V. Mirone (2012). "Curr Opin Urol **22(6): 489-494.**

## DIAGNÓSTICO:



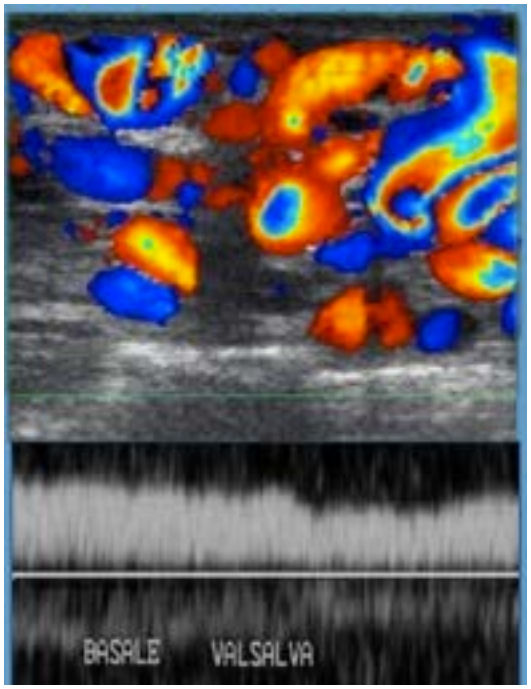
Ectasic vesseld (>3mm)
Reflow (>2sec) under Valsalva, peritesticular

Grau I




Ectasic vesseld (>3mm)
Reflow (>2sec) in basal conditions, both increasing under Valsalva

Grau II

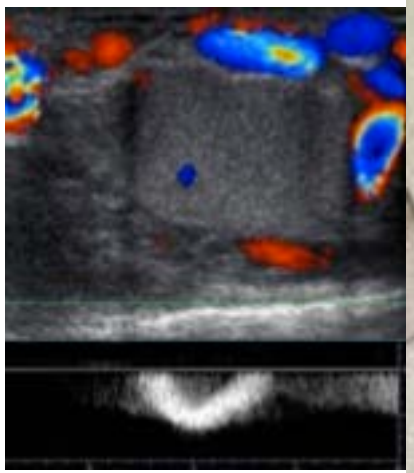



Ectasic vesseld (>3mm)
Reflow (>2sec) in basal conditions, both NOT increasing under Valsalva

Grau III

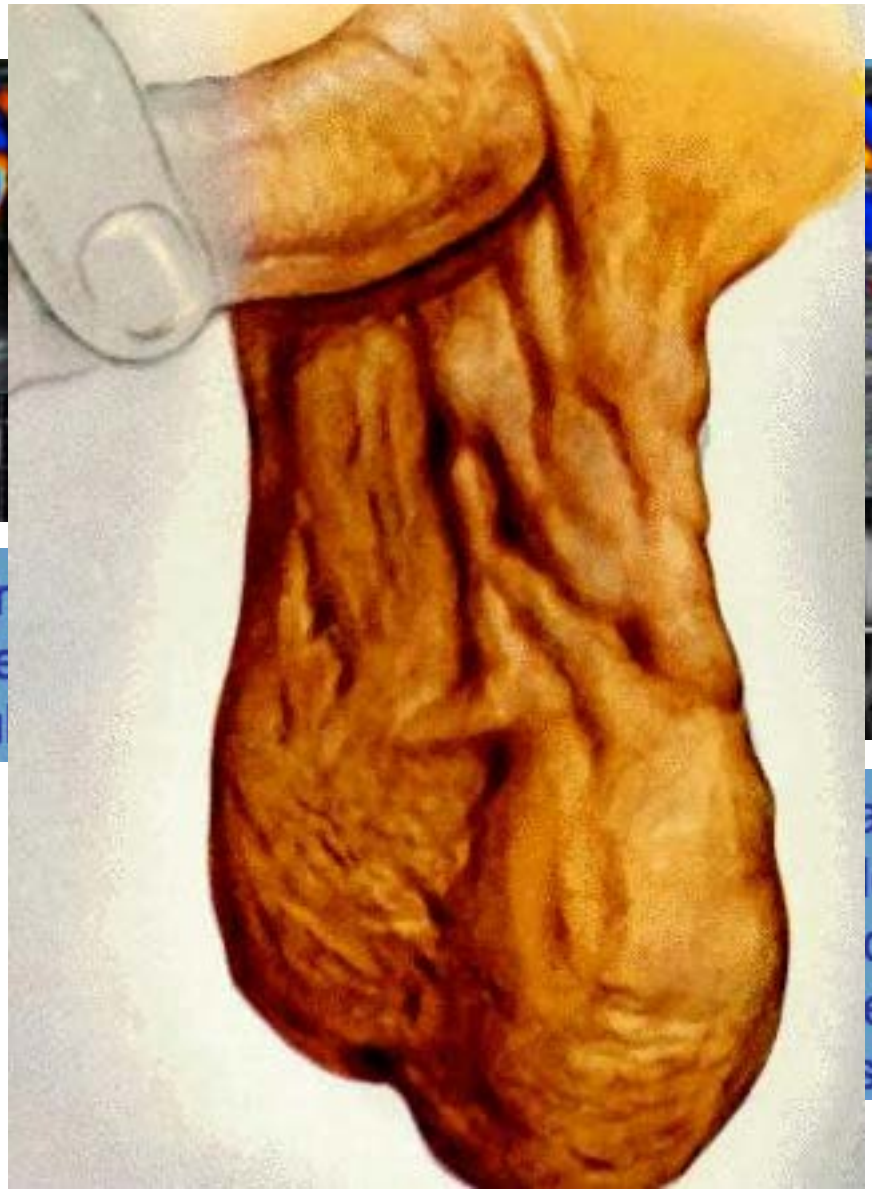
Ollandini G et al, 2013

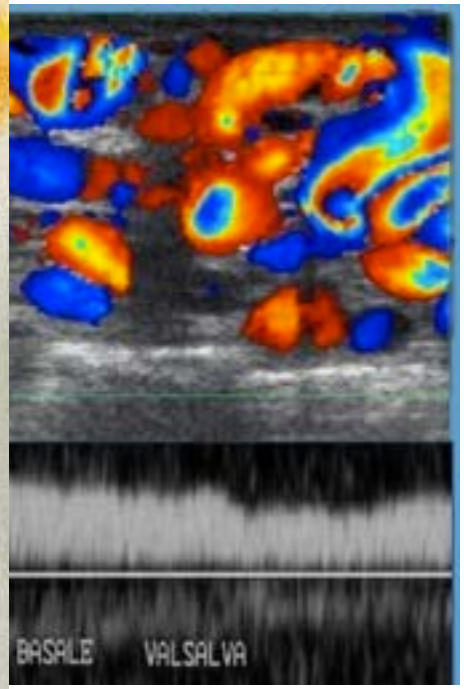
## DIAGNÓSTICO:



Ectasic vesseld (>3r
Reflow (>2sec) unde
Valsalva, peritesticu

Grau I



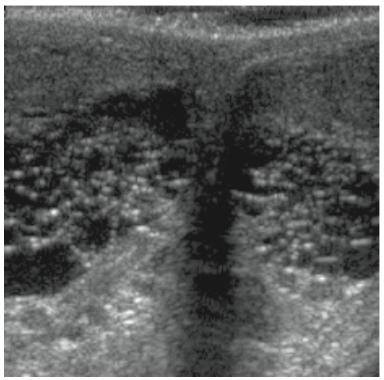


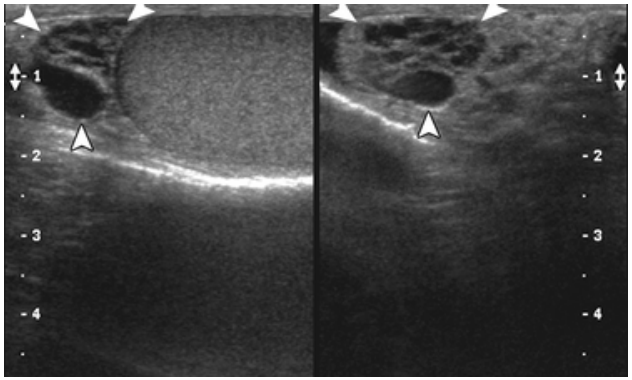

asic vesseld (>3mm)
low (>2sec) in basal
ditions, both NOT
easing under
salva

Grau III

Ollandini G et al, 2013

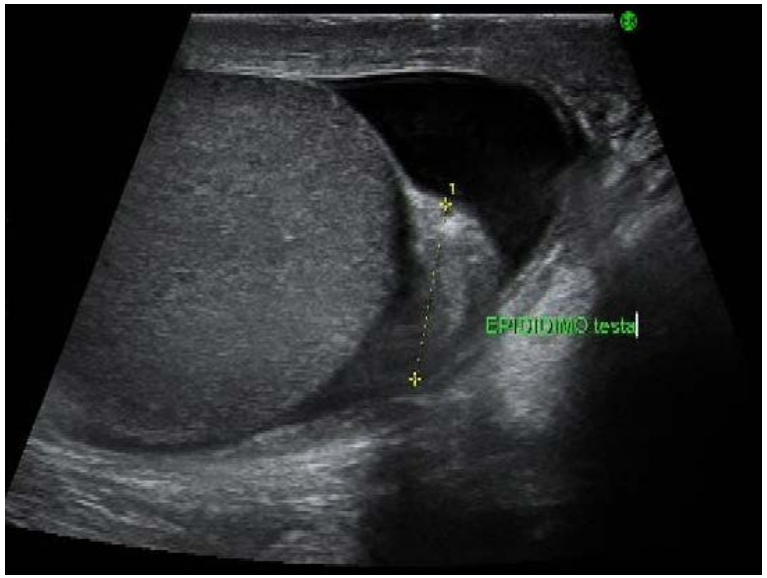
# Diferenciar Azoospermia Obstrutiva de Não Obstrutiva





**Epididymis caput cross diameter**

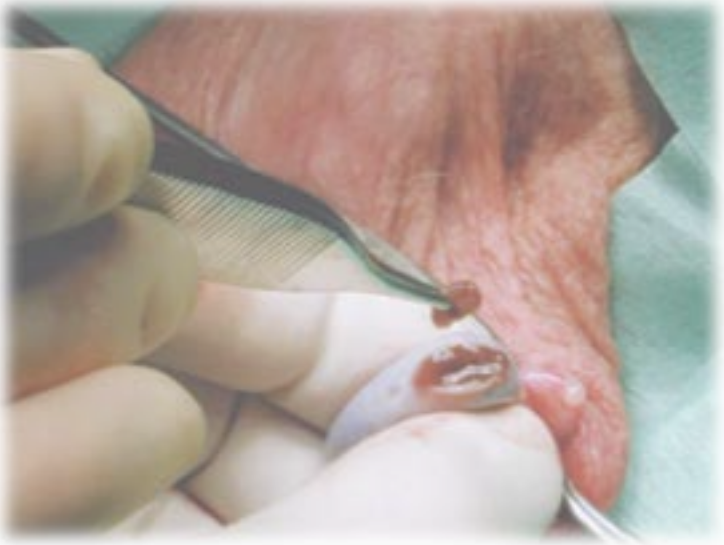
Normal
0,4 – 1,1 mm



> 10,85 mm
OA ≈ 92,3%

Pezzelle et al. Androl 2013
Pilatz et al. Ultraschell Med 2013

# Guiar TESE



Arch Androl. 2005 Jul-Aug;51(4):277-83.

**Power Doppler ultrasound mapping in nonobstructive azoospermic patients prior to testicular sperm extraction.**

Tunç L, Alkibay T, Küpeli B, Tokgöz H, Bozkirli I, Yücel C.

Gazi University, School of Medicine, Department of Urology, Ankara, Turkey.

Int Urol Nephrol. 2005;37(3):535-40.

**Sperm recovery prediction in azoospermic patients using Doppler ultrasonography.**

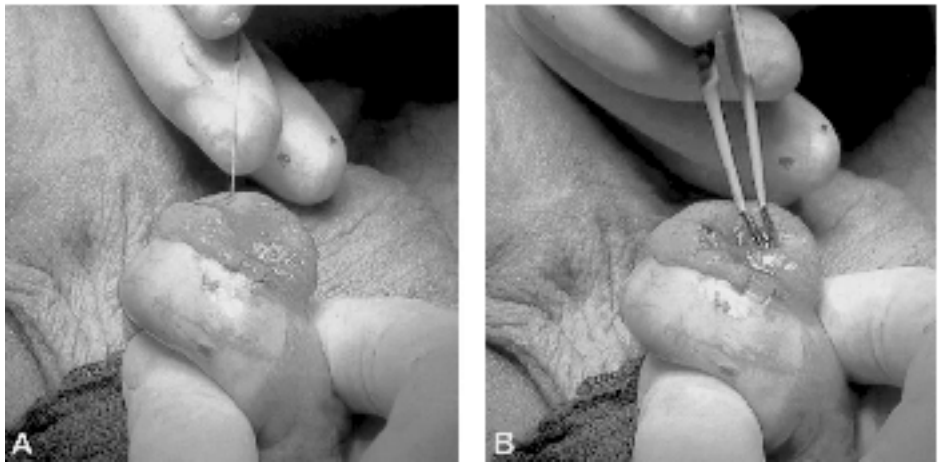
Souza CA, Cunha-Filho JS, Fagundes P, Freitas FM, Passos EP.

Human Reproduction Center, Hospital de Clínicas de Porto Alegre, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil.

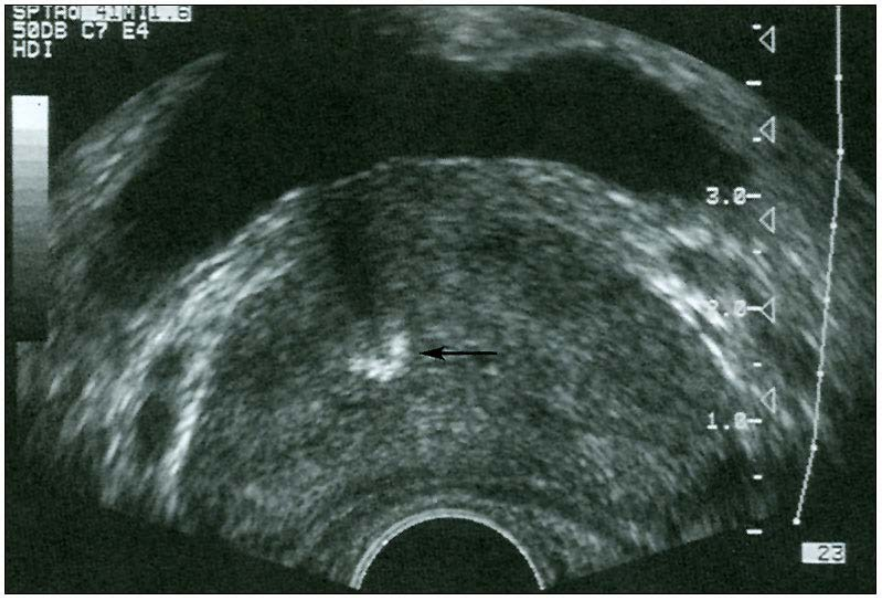
# Guiar TESE

Conf Proc IEEE Eng Med Biol Soc. 2010;2010:6469-72.
**Ultrasonically actuated silicon-microprobe-based testicular tubule metrology.**
Ramkumar A, Lal A, Paduch DA, Schlegel PN.
Blue Highway, LLC, Syracuse, NY 13244, USA.

J Assist Reprod Genet. 2004 May;21(5):175-80.
**Tissue perfusion essential for spermatogenesis and outcome of testicular sperm extraction (TESE) for assisted reproduction.**
Herwig R, Tosun K, Pinggera GM *et al*
Department of Urology,
University Hospital of Innsbruck, Austria.



# ECOGRAFIA PROSTÁTICA




**Suspeita de obstrução do ducto ejaculatório:**

- **🡻 volume (< 1mL)**
- **pH ácido (< 7,0)**
- **🡻 ou ✕ fructose**

**… e deferentes palpáveis.**

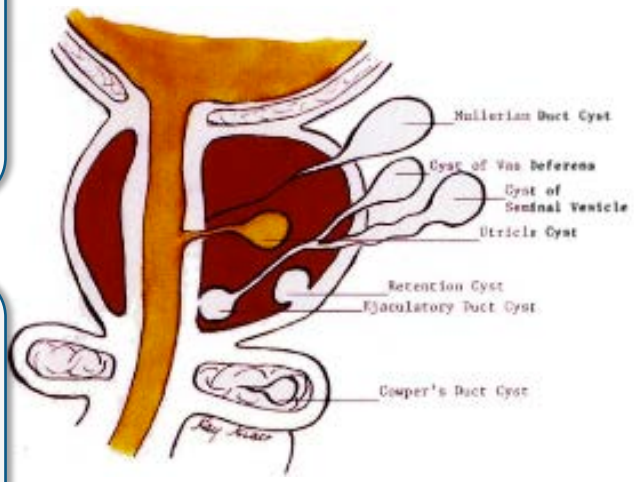
**Causas de obstrução do ducto ejaculatório:**

**Congénitas**

- Atrésia ou estenose
- Anomalias ducto Mullerian
- Anomalias ducto Wolffian

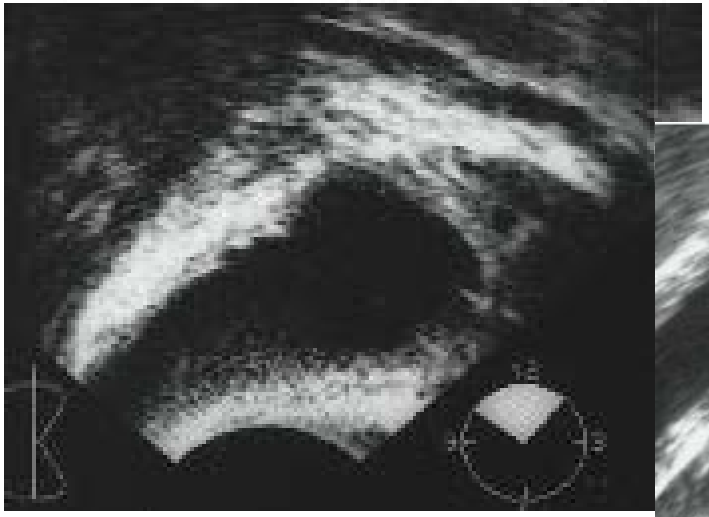
**Adquiridas**

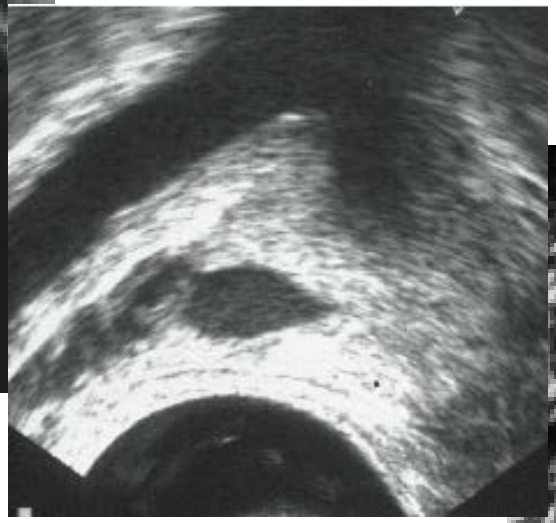
- Condições inflamatórias
- História de cateterizações
- Antecedentes de cirurgia transuretral

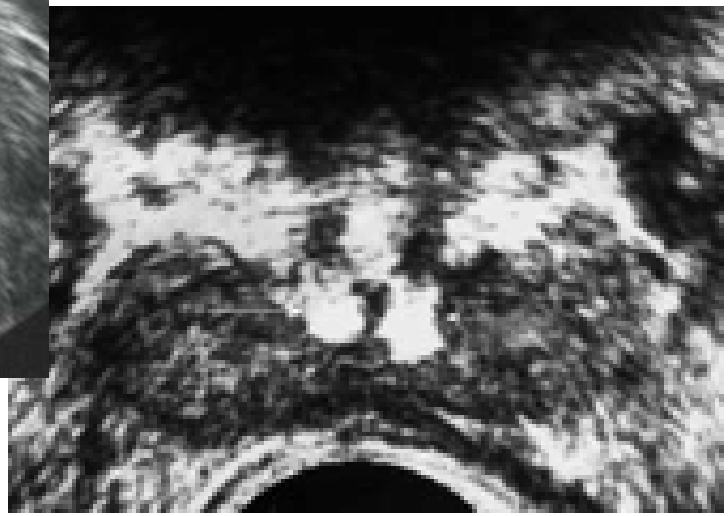



**Clínica:**

- **Infertilidade**
- **Dor na elaculação, diminuição volume ejaculado, hematospermia, dor perineal**







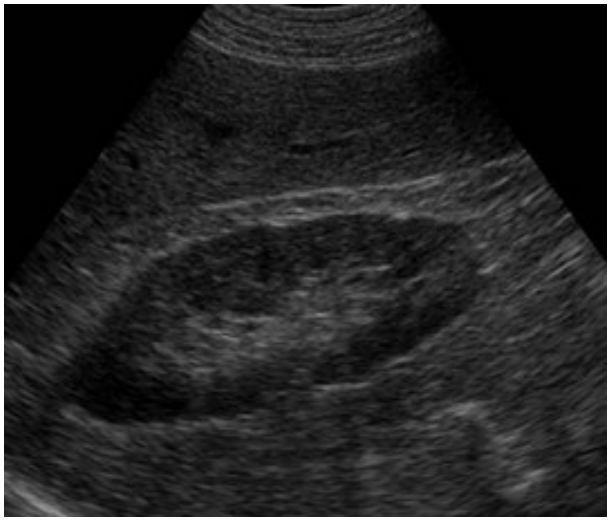
- **Dilatação da vesícula seminal (> 15mm)**
- **Ducto ejaculatório dilatado**
- **Calcificação /cálculo no ducto ejaculatório ou *verumontanum***

# ECOGRAFIA ABDOMINAL

**Vesículas seminais hipoplásicas, atróficas ou ausentes**

**Ausência unilateral deferente e CFTR –**

**25% → agenesia renal**



**Morfogênese inapropriada do ducto mesonéfrico 7ª semana gestação**

# EXAMES IMAGIOLÓGICOS NA INFERTILIDADE MASCULINA

**ECOGRAFIA**

- Escrotal
- Prostática
- Abdominal

**RMN**

- Cerebral
- Endorectal e Pélvica

**ESTUDOS CONTRASTADOS**

- Flebografia espermática
- Deferentografia
- Vesiculografia seminal

# RMN CEREBRAL

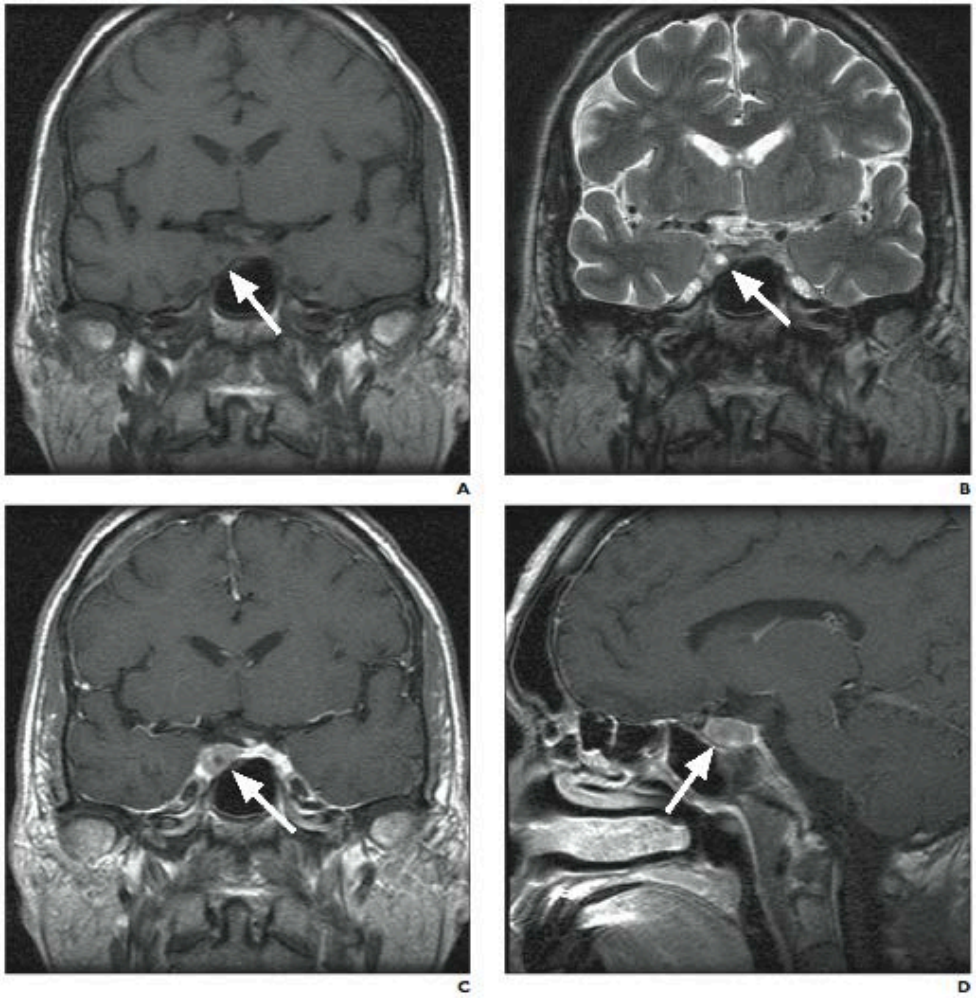
**CAUSA HORMONAL**

**(anomalias do eixo hipotálamo-hipófiso-gonadal)**

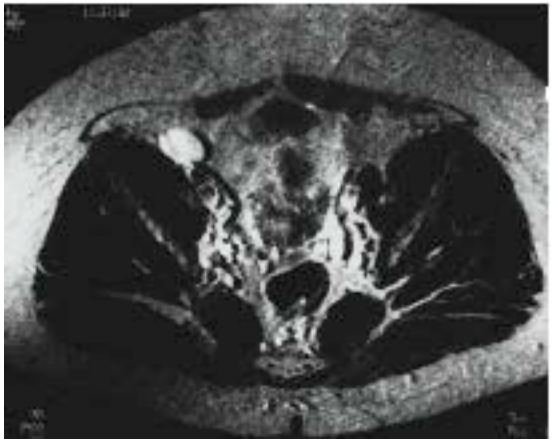
**RARO**

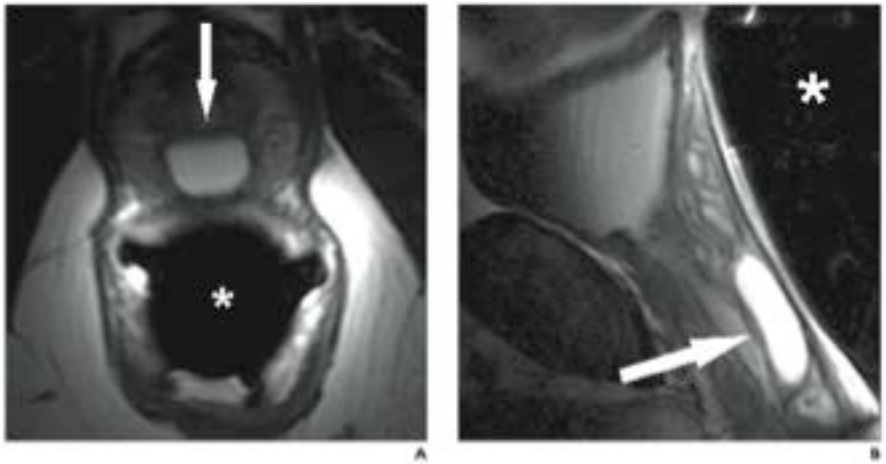
**Hipogonadismo**

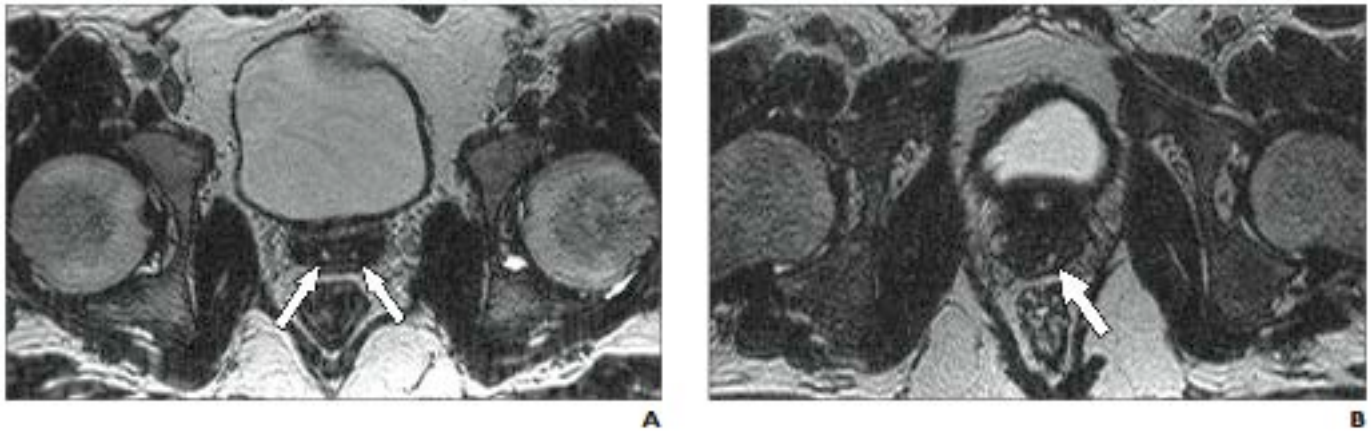
**Prolactina > 2 x N**



# RMN ENDORECTAL E PÉLVICA







# EXAMES IMAGIOLÓGICOS NA INFERTILIDADE MASCULINA

**ECOGRAFIA**

- Escrotal
- Prostática
- Abdominal

**RMN**

- Cerebral
- Endorectal e Pélvica

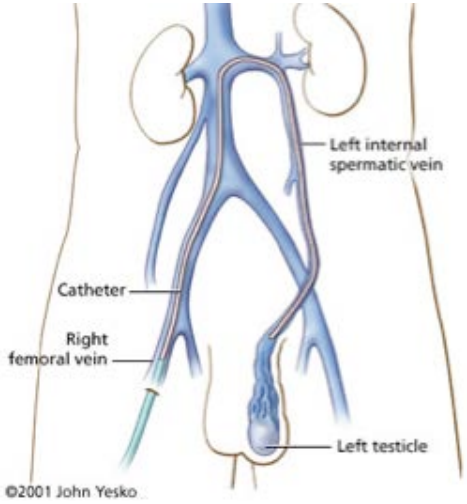
## ESTUDOS CONTRASTADOS

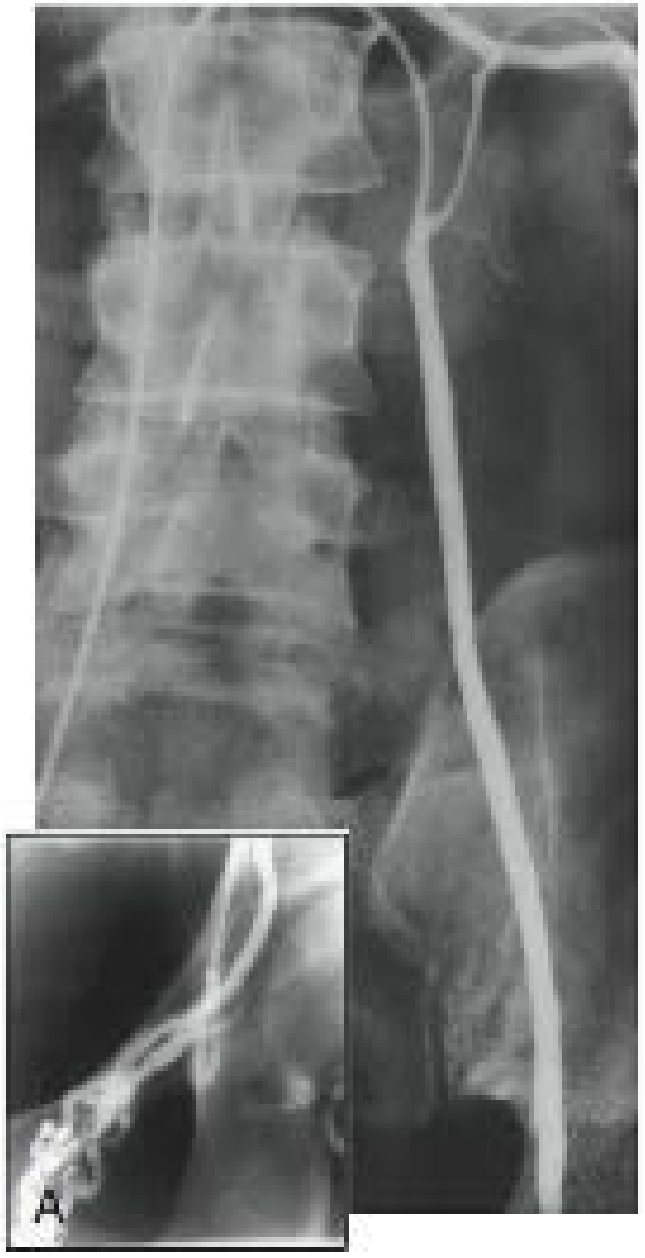
- Flebografia espermática
- Deferentografia
- Vesiculografia seminal

# FLEBOGRAFIA ESPERMÁTICA

- **Diagnóstico**
- **Terapêutico**

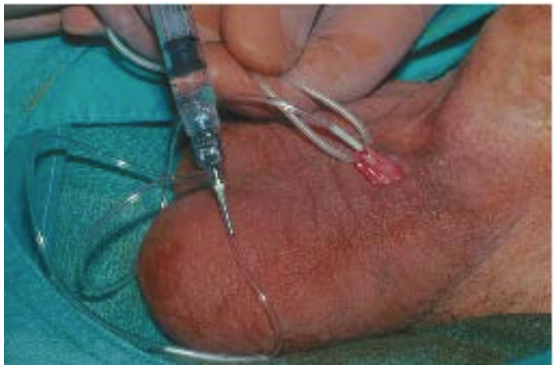
**(+++ após recorrências)**

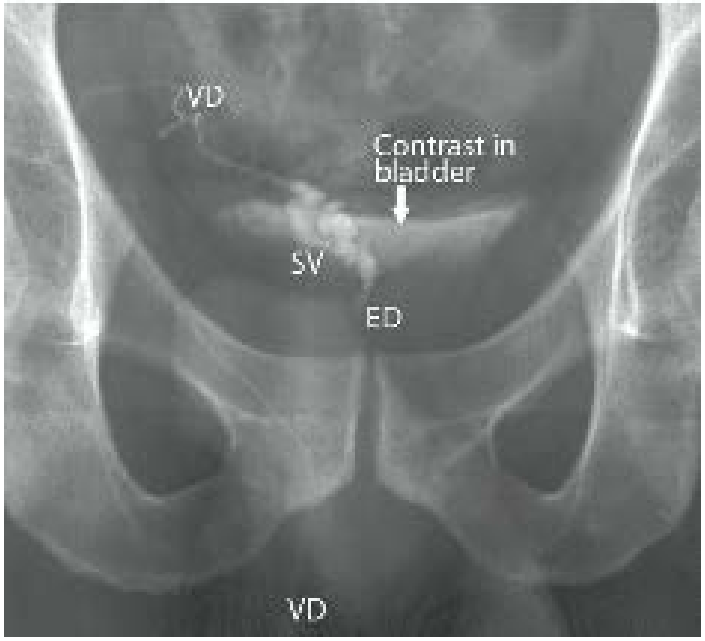


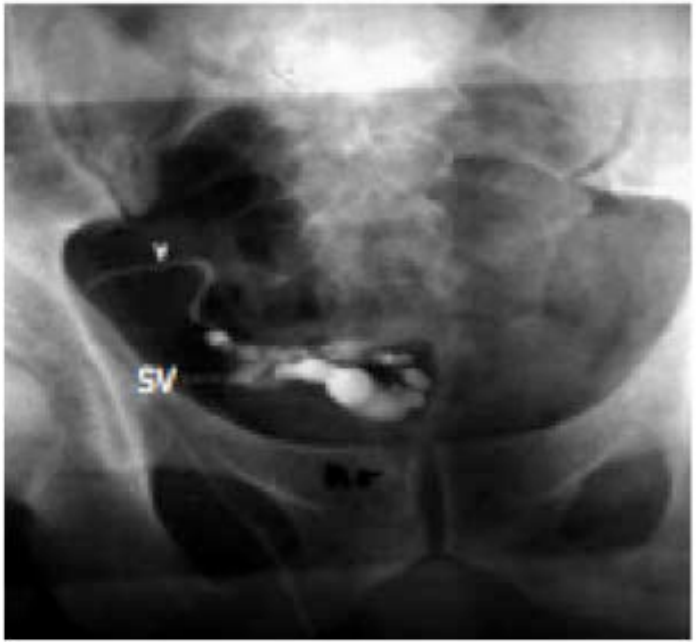



# DEFERENTOGRAFIA

- **Exame *tradicional* para avaliar obstrução ducto ejaculatório**
- **Pouco utilizado actualmente**
  - **risco de estenose deferente e obstrução!**
  - **invasivo**
- **No mesmo tempo da reconstrução cirúrgica**

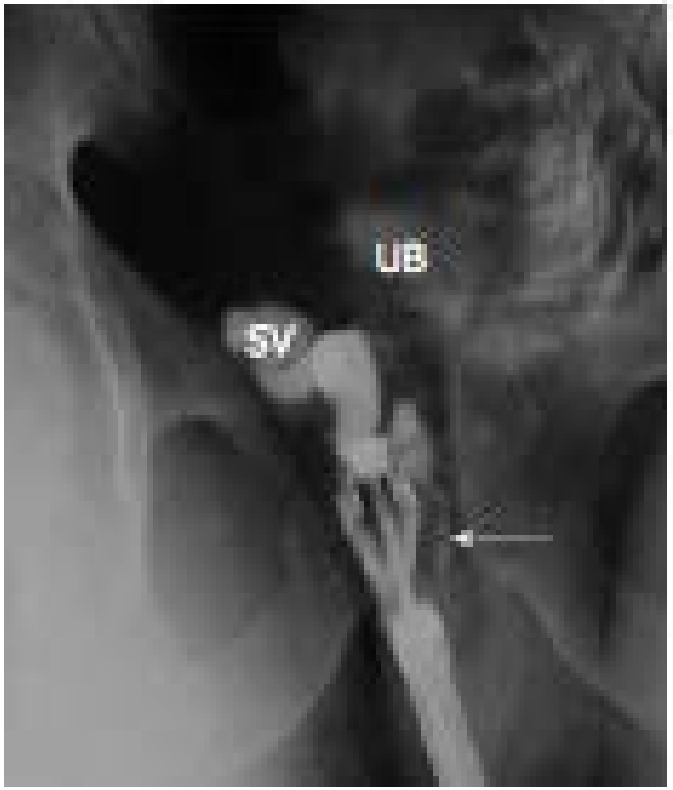


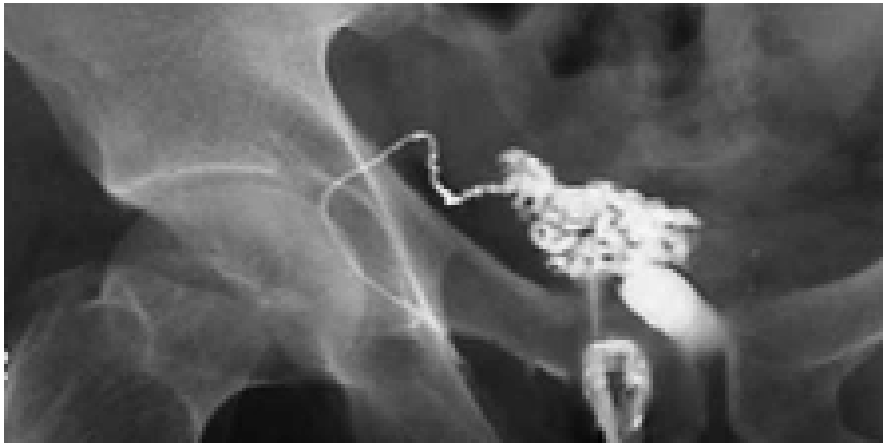


# VESICULOGRAFIA SEMINAL

- **Exame utilizado para avaliar obstrução ducto ejaculatório**
- **Eco-guiado**
- **Pouco utilizado actualmente**



# CONSIDERAÇÕES FINAIS

## EXAMES IMAGIOLÓGICOS NO ESTUDO DA INFERTILIDADE MASCULINA:

- **Não são necessários em todos os homens.**

1) **Ecografia escrotal ++++**
   **(varicocelo e massas testiculares)**

2) **Ecografia transrectal**
   **(identificação de obstrução do tracto genital)**