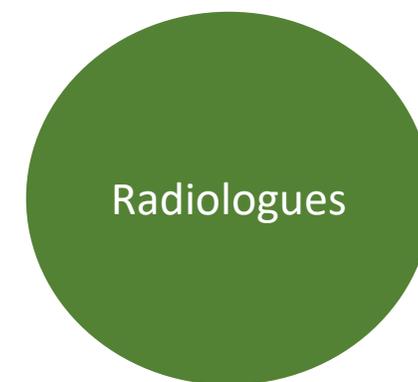
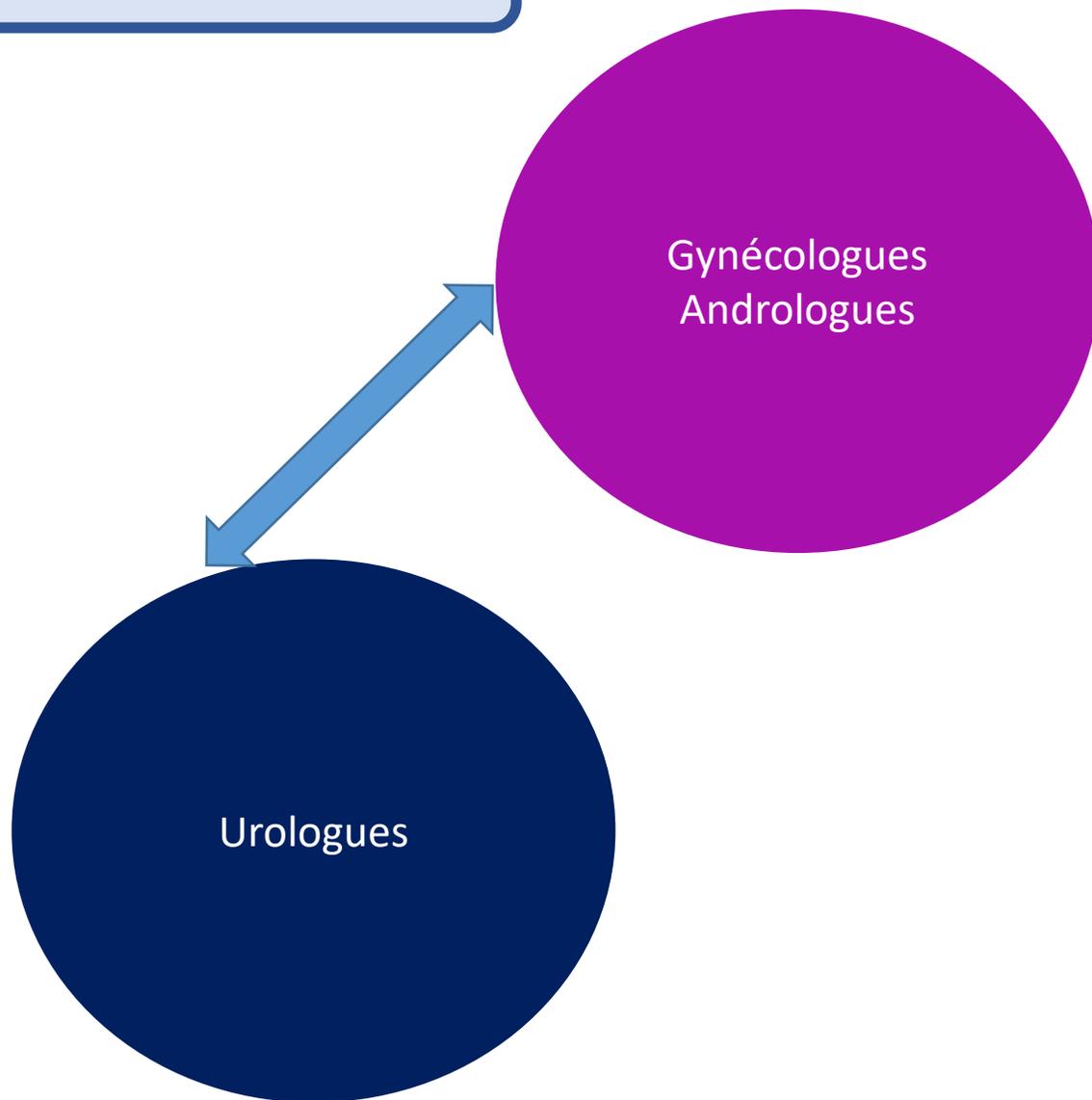


Place de l'imagerie dans la prise en charge de l'infertilité masculine

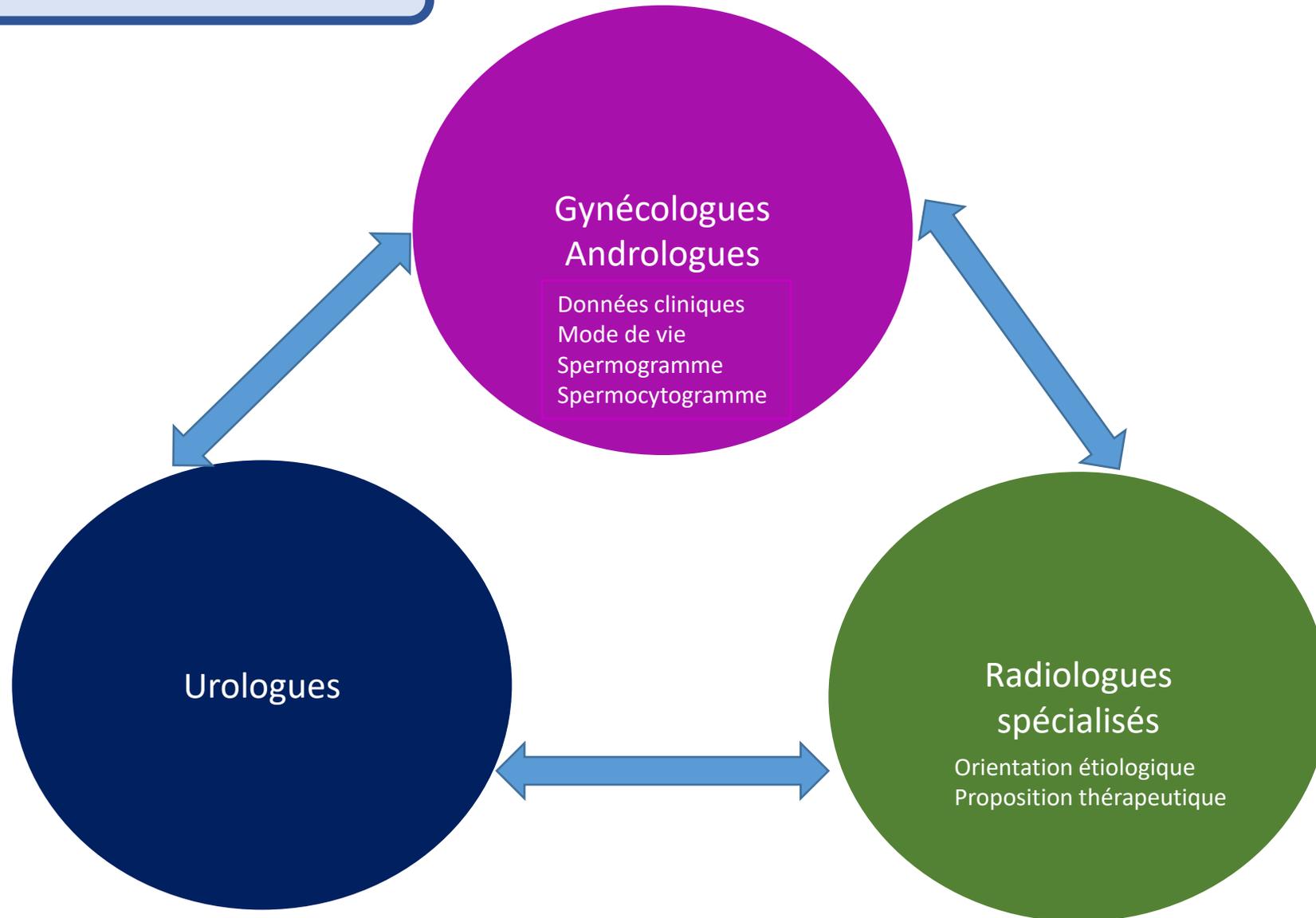
Florian Maxwell et toute l'équipe d'imagerie urogénitale
Service d'imagerie du Pr Olivier Meyrignac
Service d'imagerie du Pr Laurence Rocher
GH Bicêtre & Bécélère APHP

AU COMMENCEMENT...



Faible valeur ajoutée CR
Incompréhension des enjeux

AU COMMENCEMENT...



Fiabilité de l' échographiste...:
deux éléments indispensables devant
figurer dans le compte rendu

- **Volume** (ml)
- description de l'ensemble de **l'épididyme et du déférent**
- Azoospermie : échographie exceptionnellement normale!

Examen réalisé le

ECHO-DOPPLER TESTICULAIRE ET ECHOGRAPHIE DES VOIES GENITALES PROFONDES

Renseignements cliniques :

Enfants/grossesses

Cryptorchidie/test Oscillants

Infections

Hernie inguinale

Trauma

Médicaments

Toxiques professionnels

Chaleur/bain

Tabac

Douleur scrotale (Aigue/chronique, coté)

Spermogramme : azoospermie/OAT modérée/OAT sévère/crytozoospermie/térato isolée

Volume éjaculat

FSH UI/l

Inhibine B

Testo ng/ml

	DROIT	GAUCHE
Dimensions : H x l		
Volume : H x l x 0,523		
Echostructure de base : homogène, grossière, nodulaire, striée		
Nodules : O/N taille / situation / échostructure		
Dilatation du rete testis : O/N		
Microlithiase : O (grade, situ) / N		
Calcification : O/N		
Epididyme : Position (modale/inversée) Ectasie tubulaire : O/N Défèrent scrotal : visible (O/N) Normal/épaissi/sténosé		
Hydrocèle : 0 (coter en +) / N		
Varicocèle : veines trop nombreuses (O/N) Calibre des veines : Reflux au cordon : O/N si oui, préciser Intensité (+, ++, +++) Durée en secondes		
Prostate : taille/poids Echostructure Calcifications Canaux éjaculateurs (virtuels, dilatés, calcifiés)		
Vésicules séminales : taille, aspect		
Ampoules déférentielles : présence/épaisseur		

Conclusion :

STRATEGIE

- ECHO-DOPPLER → 1ère intention
 - Scrotale : B / Doppler Ultrasensible / Elasto / Contraste
 - Prostato vésiculaire
- IRM dans indications choisies après échographie
 - Caractérisations de micronodules testiculaires
 - Meilleure visualisation anomalies diffuses de la pulpe ... caractérisation?
 - Malformation voies génitales profondes

STRATEGIE

ECHO

Pas de cause obstructive

Cause obstructive

Embolisation

Varicocele

Crypto
[47,XXY]
Séquelle

Hypotrophie
Fibrose

Leydig
Autre

Nodule

IRM
Scrotale

Epididyme
Déférent
scrotal

VGP

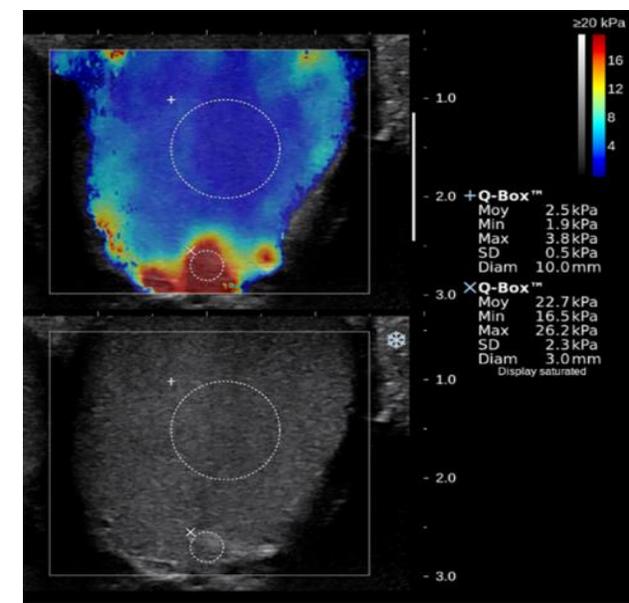
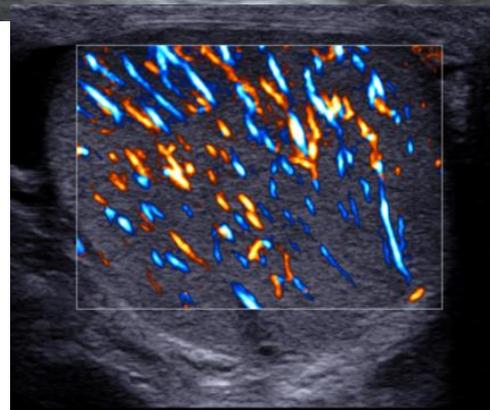
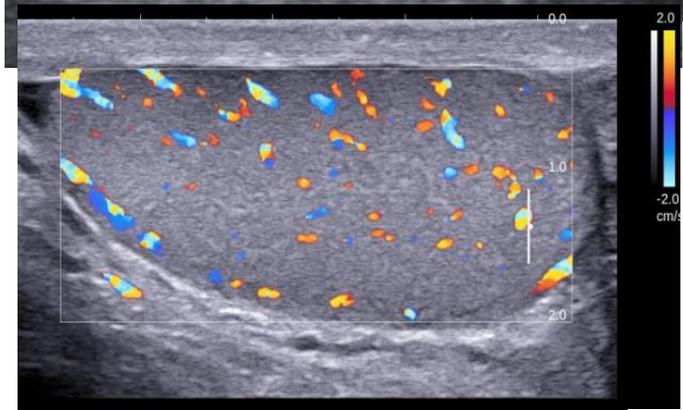
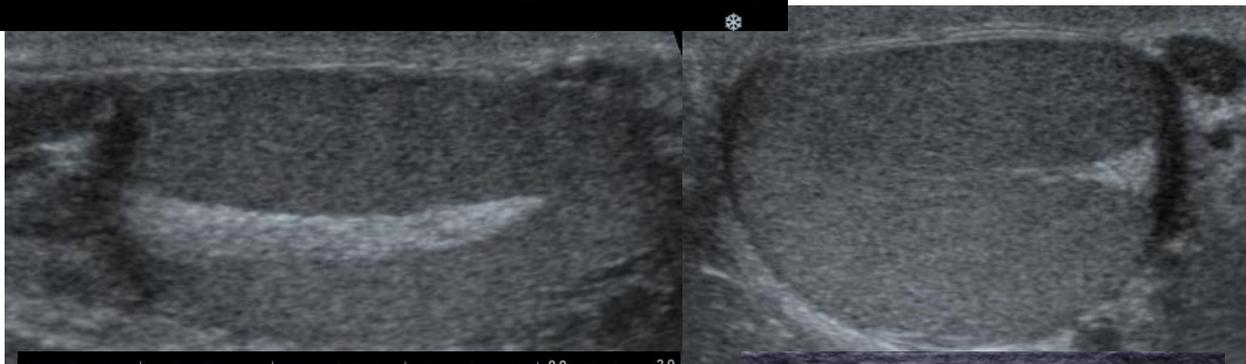
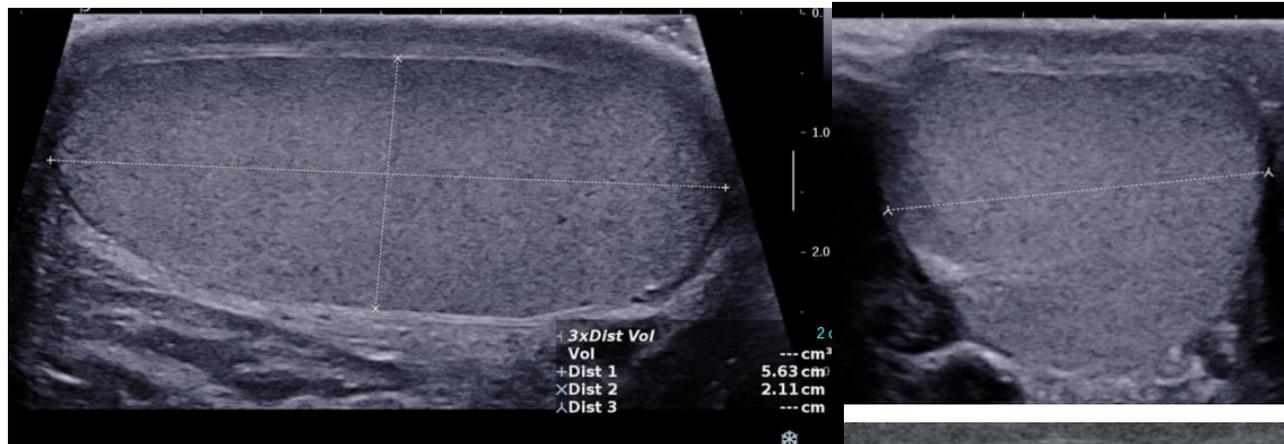
Post inf
CFTR
ABCD

Fibrose
Calcif
Zinner

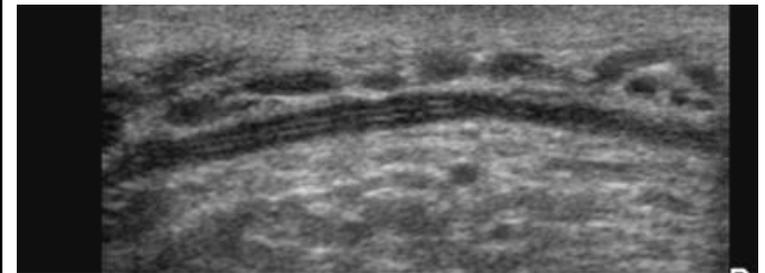
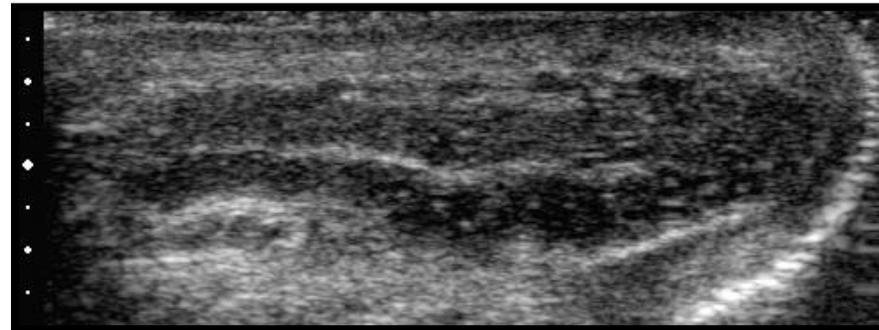
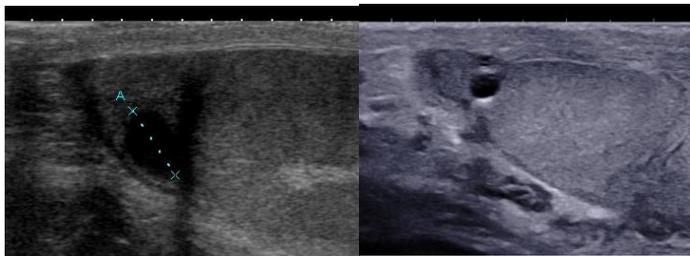
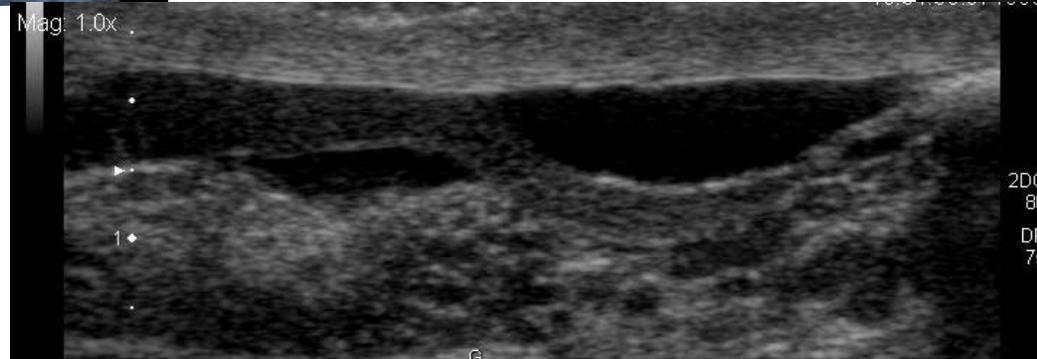
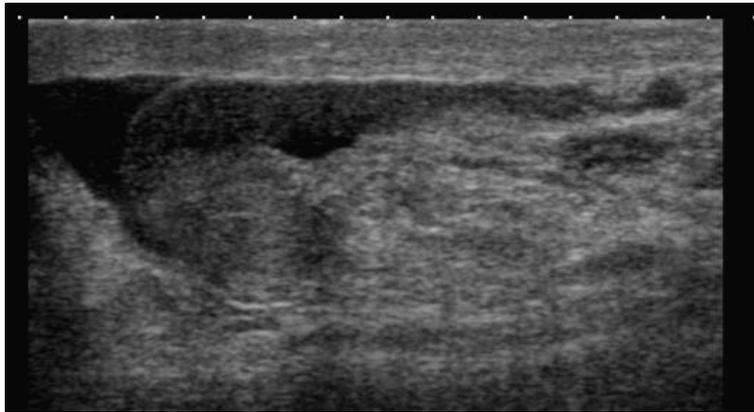
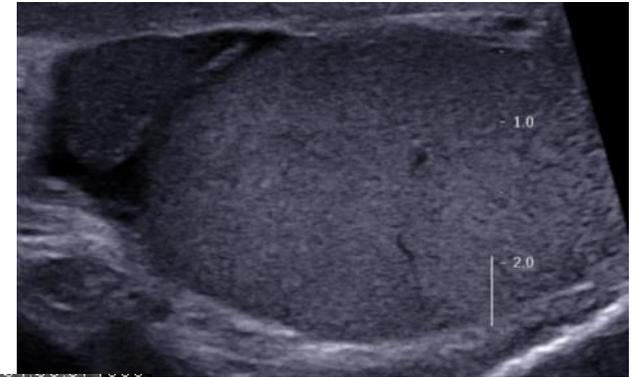
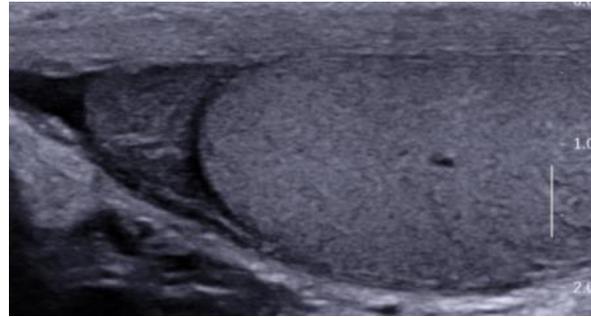
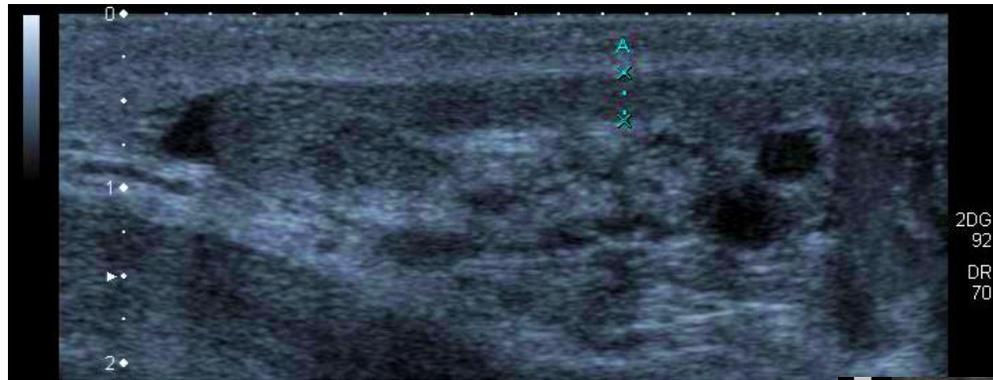
Vasectomie

IRM
VGP

ECHO NORMALE



ECHO NORMALE



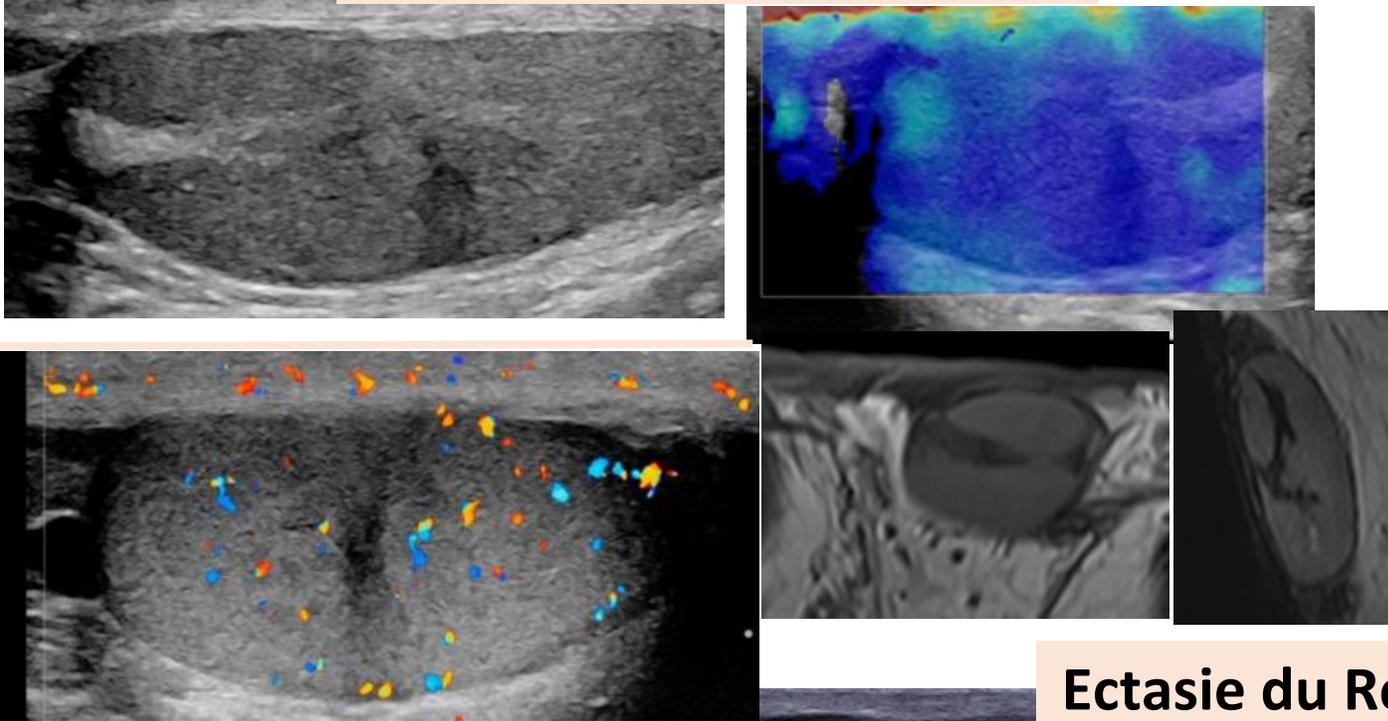
Petits kystes : très fréquents, ne pas signaler

ANOMALIES BÉNIGNES

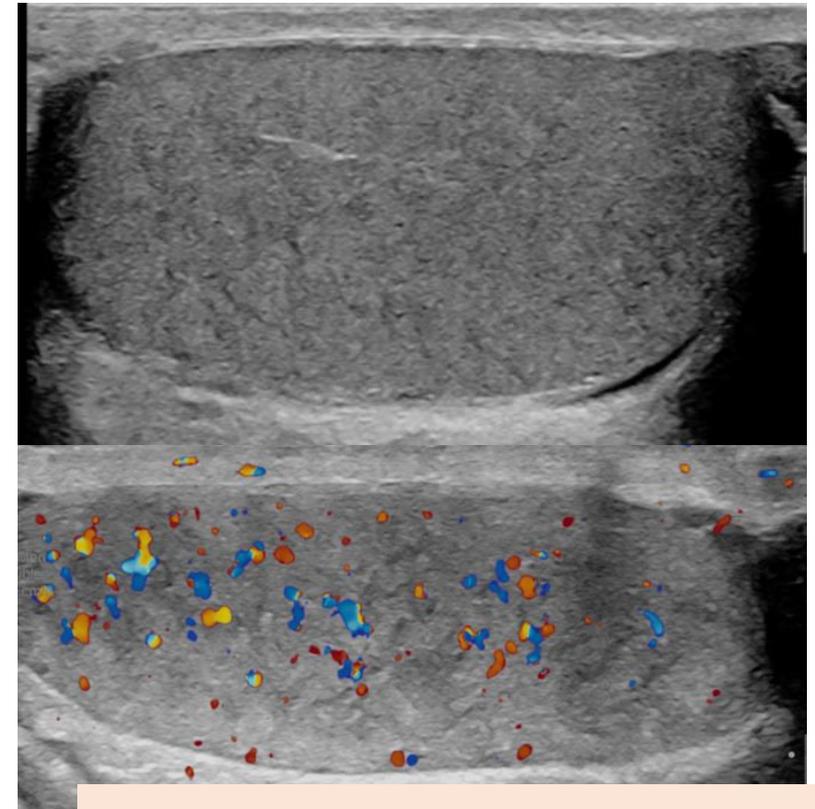
No Surgery, No Follow up !

- Echographie suffisante
- Affirmer la b nignit  !
 - Rassurer ++
 - Pas d'examens compl mentaire ni de surveillance
 - Eviter une orchidectomie non n cessaire

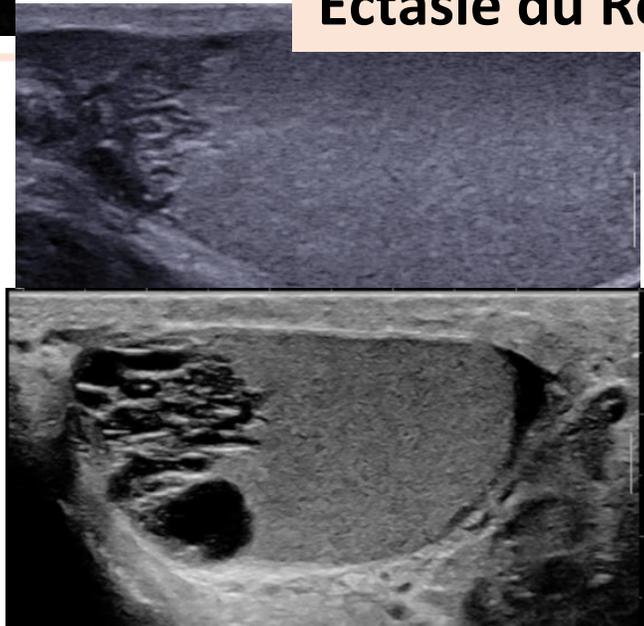
ATCD de biopsie



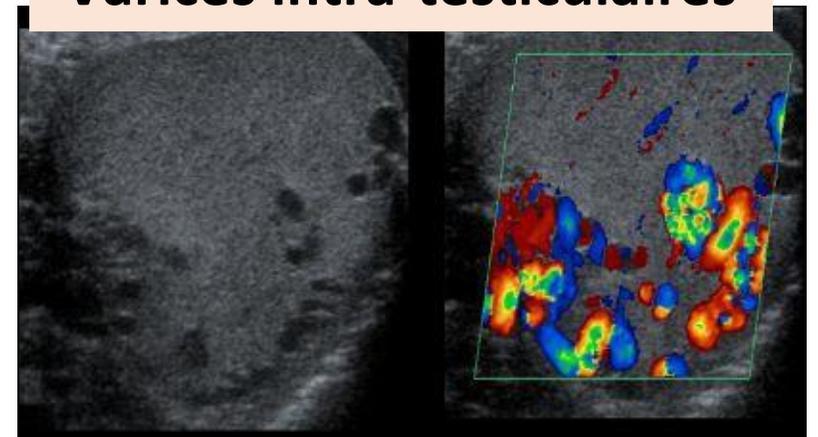
Echostructure grossière striée



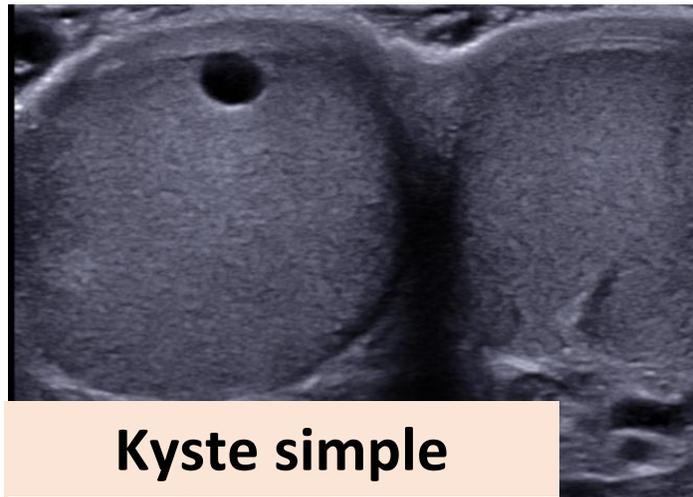
Ectasie du Rete



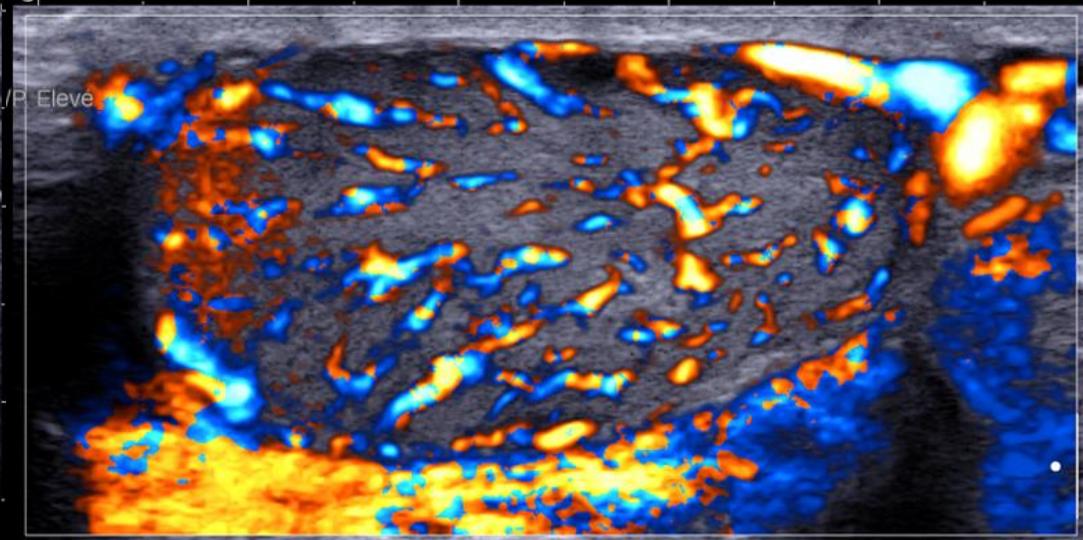
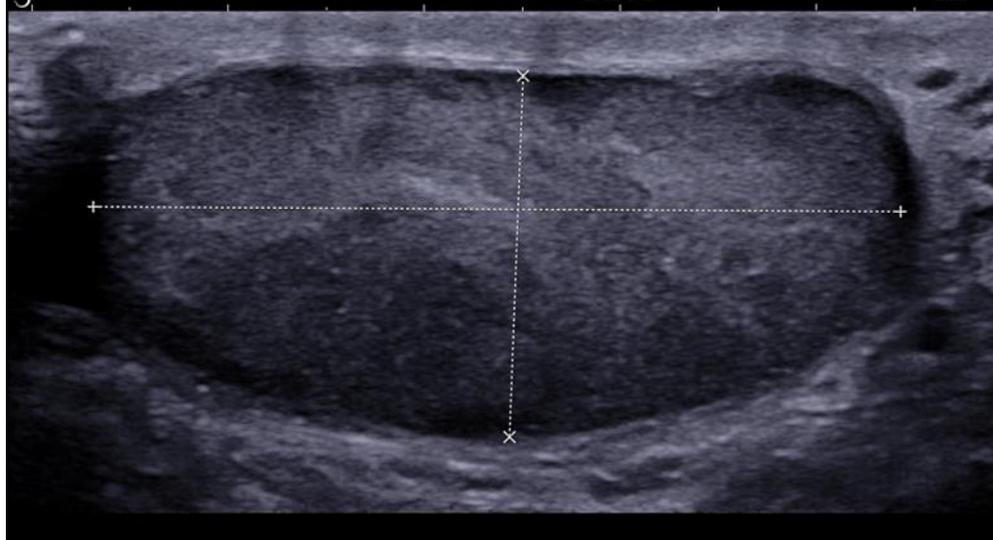
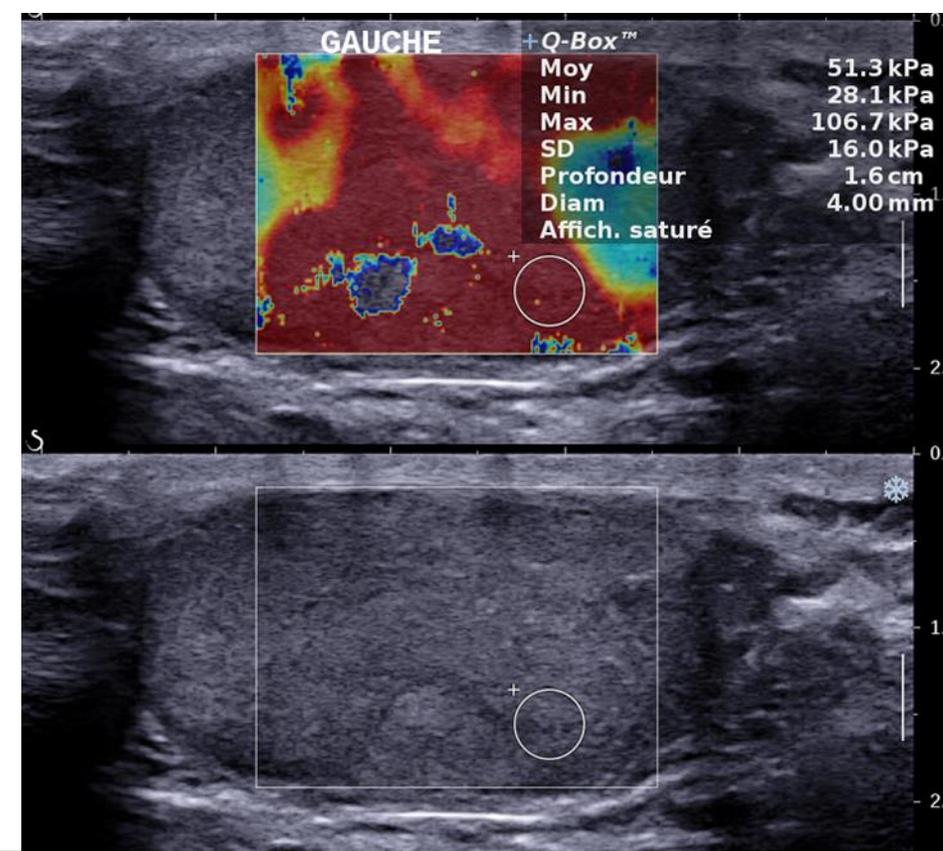
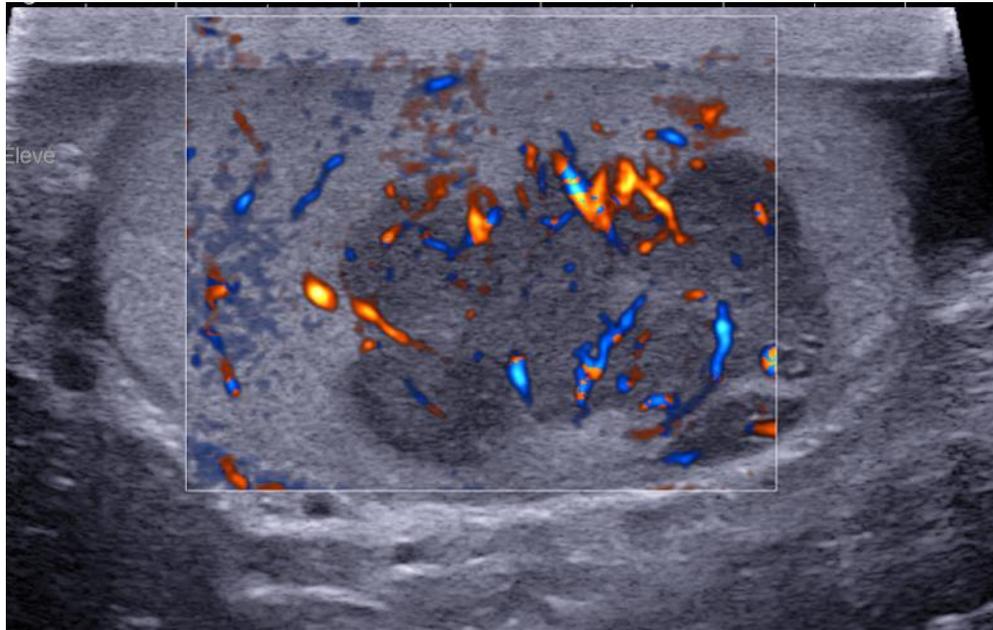
Varices intra-testiculaires



Kyste simple

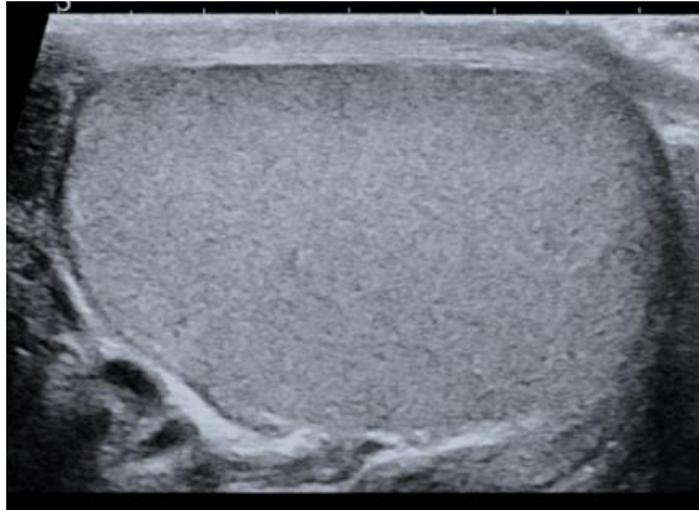


FORTE SUSPICION DE MALIGNITÉ

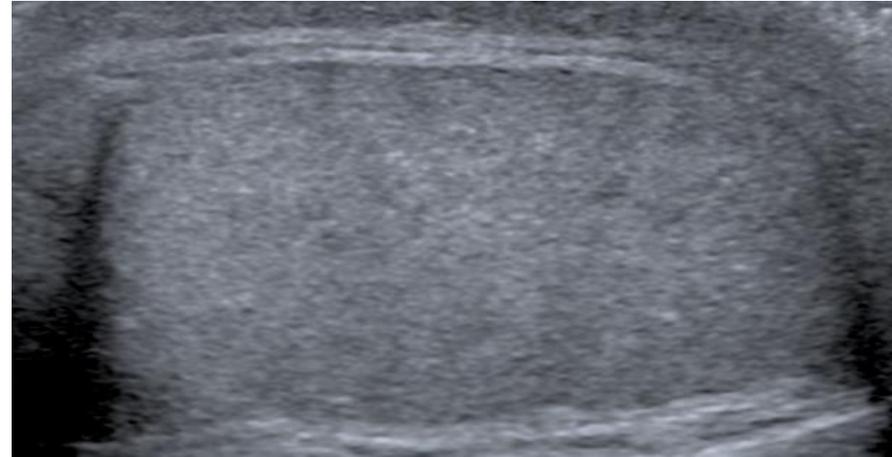


HYPOTROPHIE ? ALLER PLUS LOIN !

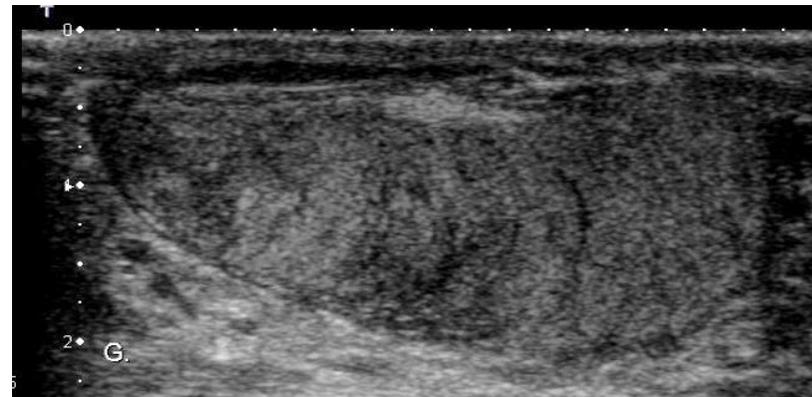
Homme jeune : quelle échostructure?



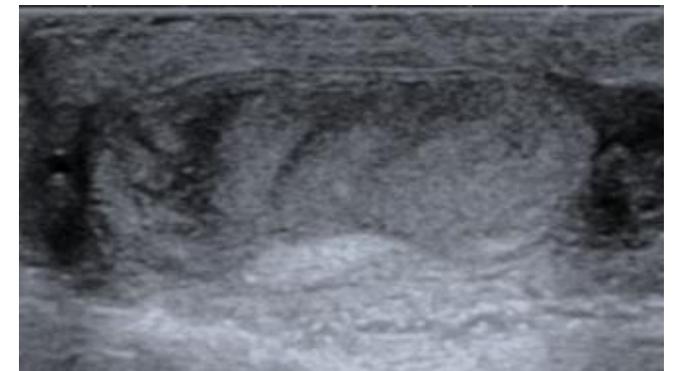
Normale



Grossière



Striée



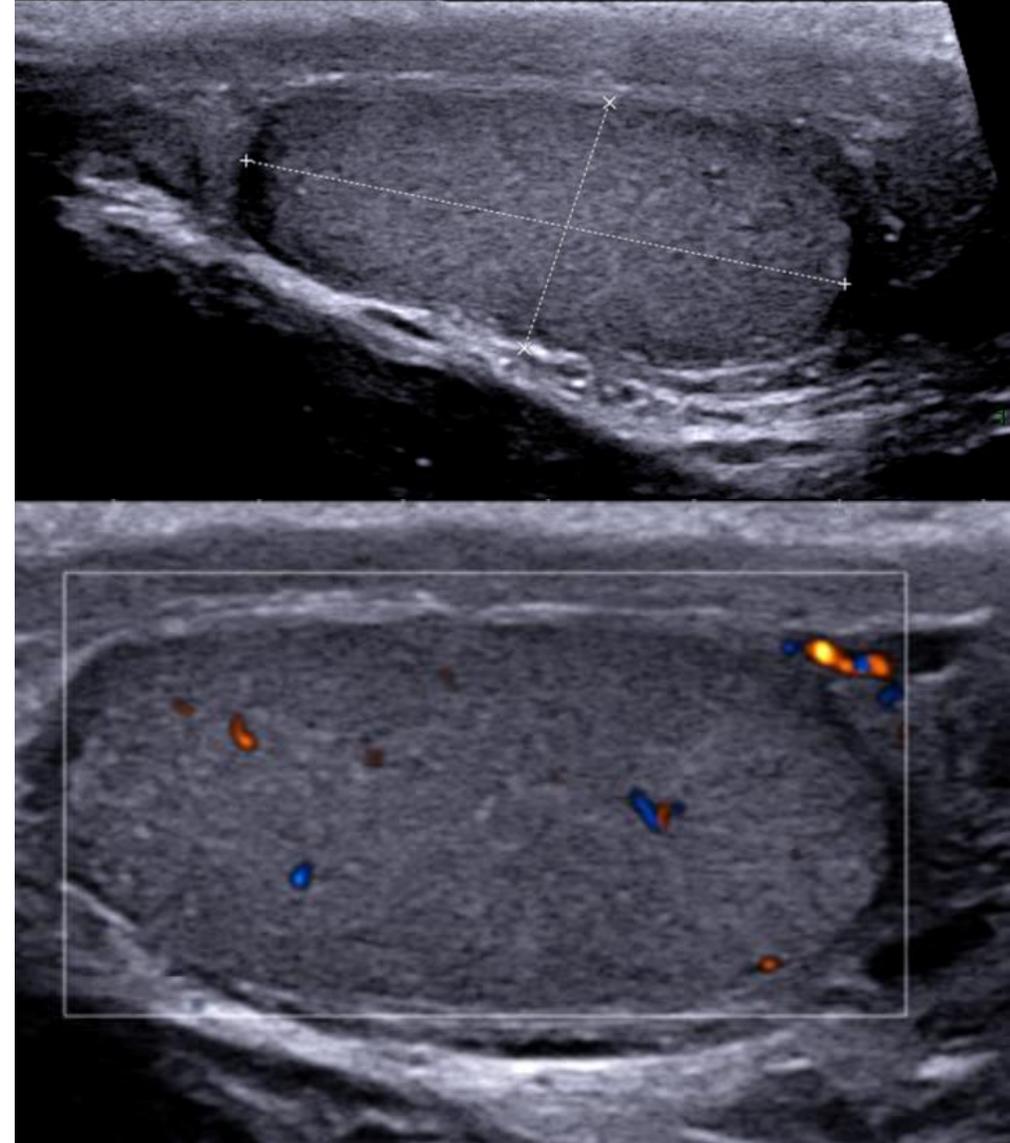
HYPOTROPHIE ? ALLEZ PLUS LOIN !

CRYPTORCHIDIE OPEREE OU NON

- Localisation
- Hypotrophie testiculaire 5-10ml
- Parfois atrophie complete
- Echostructure grossiere
- Hypoechogene / Hypovasculaire
- Risque de tumeur germinale + NGIS

ANOMALIES ACQUISES

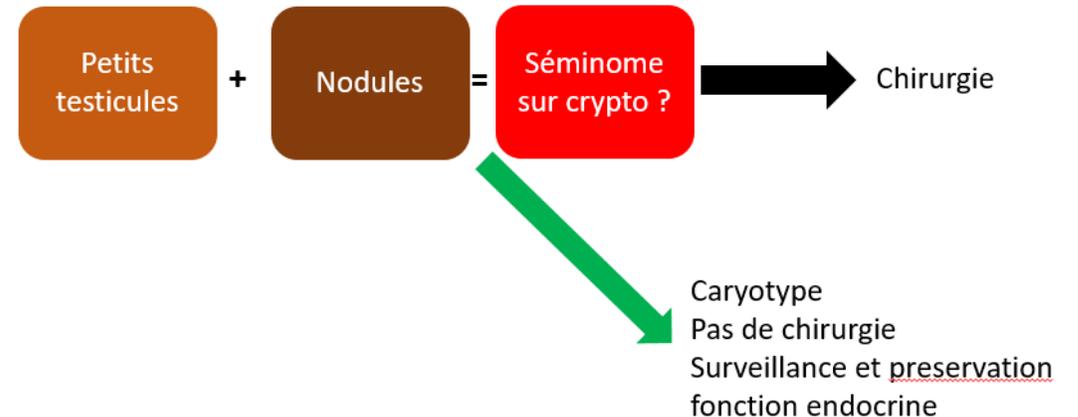
- Chimio – radiothp- chir
- Infection
- Sans cause évidente retrouvée



HYPOTROPHIE ? ALLEZ PLUS LOIN !

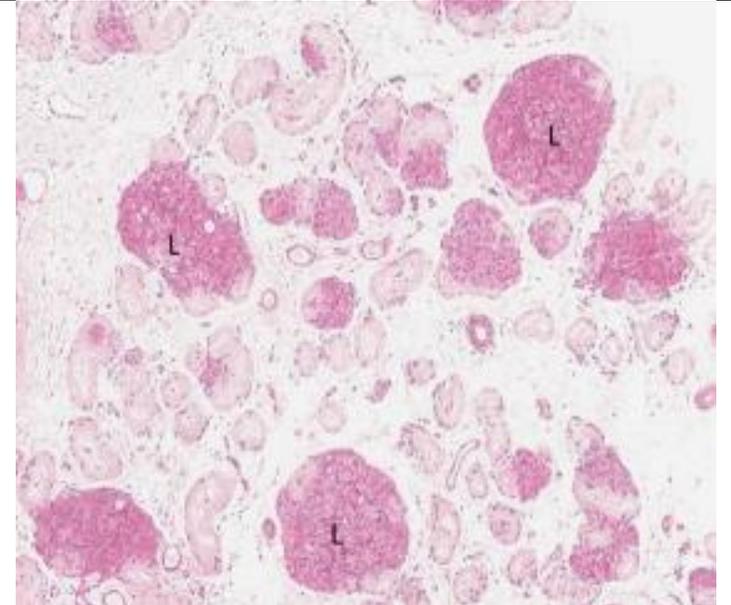
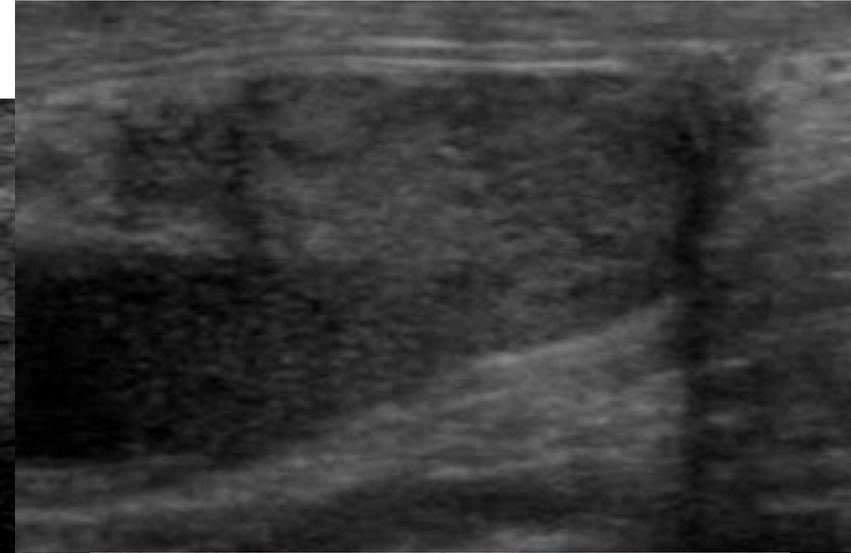
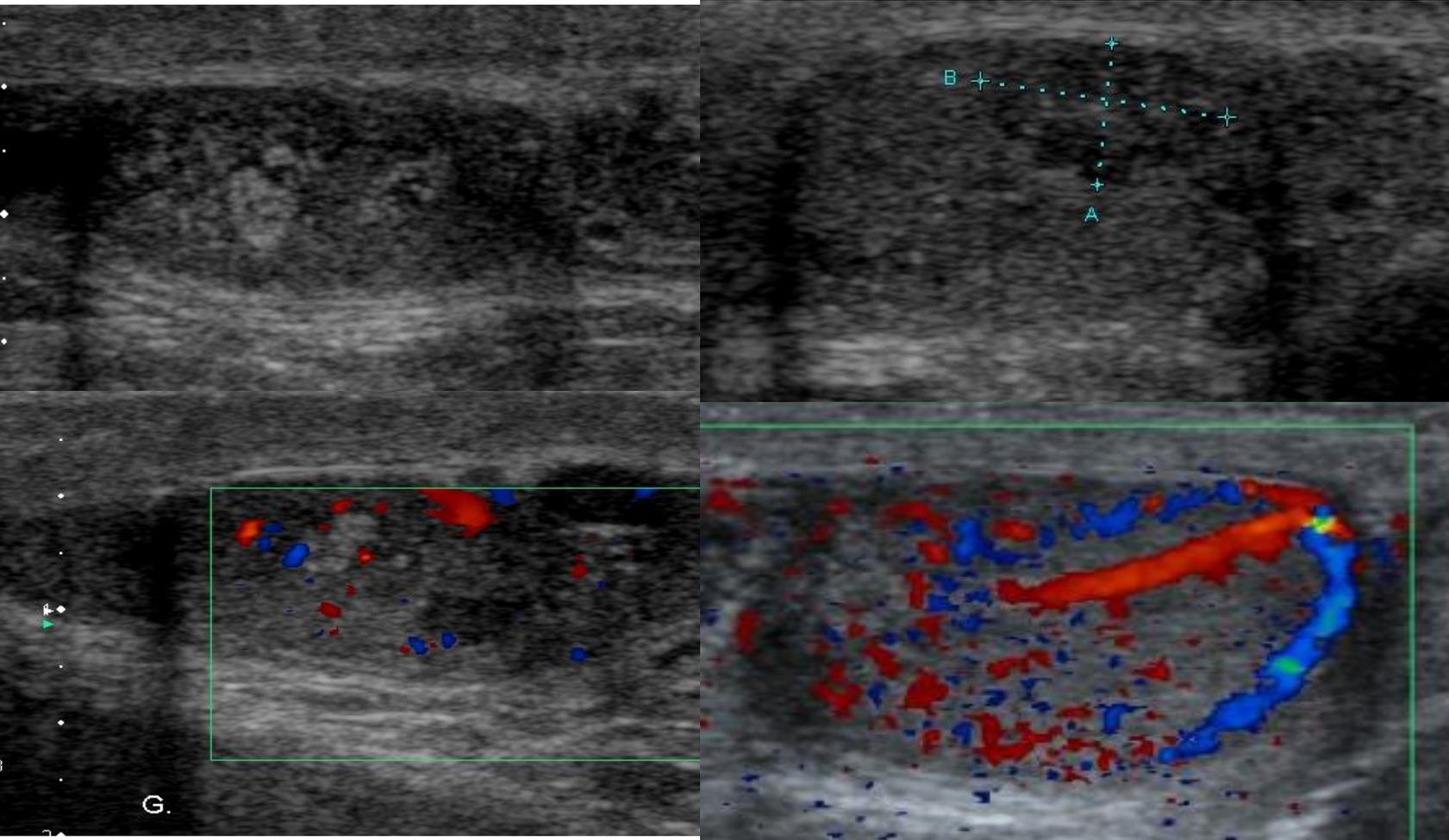
ANEUPLOÏDIE GONOSOMIQUE ET SES VARIANTES...

- **Azoospermie**
- **Microorchidie (<3ml)+++**
- **Pulpe hétérogène micronodulaire (2-3mm) hypo ou rarement hyperéchogènes**
- **Hyperplasie leydigienne et tumeurs à cellules de Leydig**
- **Hypervascularisation de la pulpe**
- **Importance de l'expertise trio endoc uro radio**



HYPOTROPHIE ? ALLEZ PLUS LOIN !

ANEUPLOÏDIE GONOSOMIQUE ET SES VARIANTES...



Autres causes d'hyperplasie C Leydig : sporadique / post CT etc...

Courtesy Pr Ferlicot

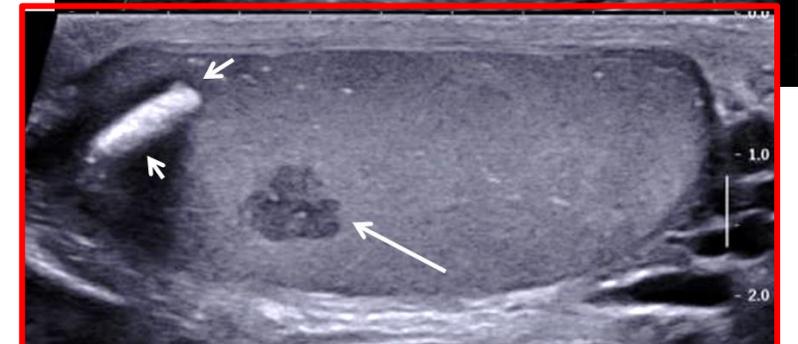
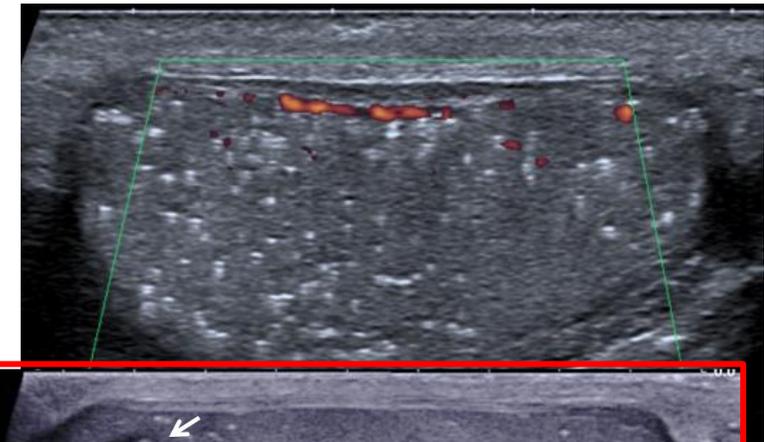
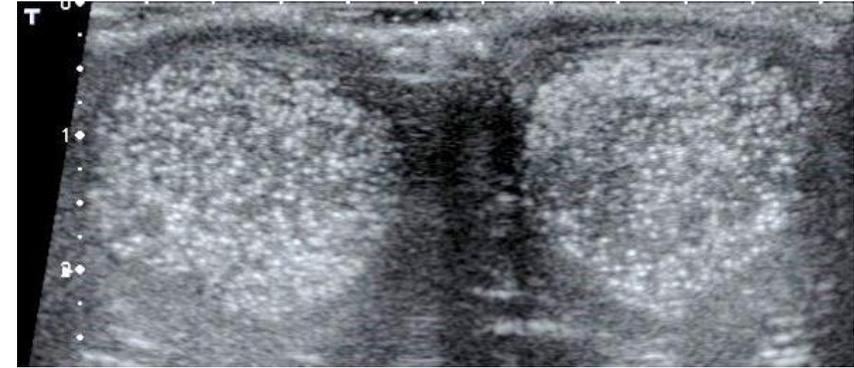
HYPOTROPHIE ? ALLEZ PLUS LOIN !

- **Nombreuses causes versant endocrinologue**
 - **Pas d'imagerie spécifique à chaque cause**
 - **Hypotrophie testiculaire**
- ❖ Kallmann (anosmie)
 - ❖ Prader-Willi
 - ❖ Dandy-Walker
 - ❖ Cushing
 - ❖ Etc...

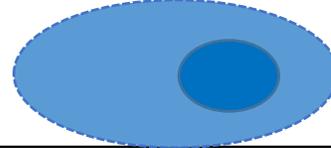
MICROLITHIASE

- Dépôt de calcium dans les tubes séminifères
- Pas de symptôme / 2-3% des hommes
- < 3 mm
- > 5 microlithes / testicule
- Non visible à l'IRM

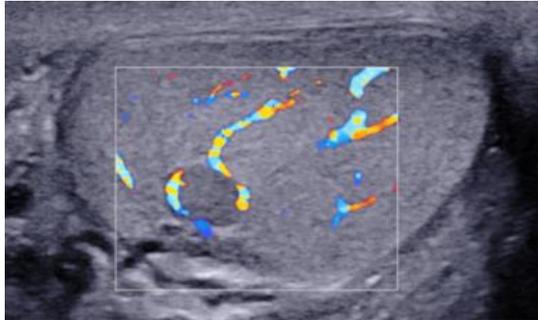
Grade 1: 5–10 microlithes
Grade 2: 11–20 microlithes
Grade 3: 21–30 microlithes
Grade 4: more than 30



MICRONODULES



Nodule solide hypoechogène vascularisé : Echo-Doppler



E
T

Faiblement hypoechogène
Vaisseaux encorbellant
Sans microlithes
Sans macrocalcification
Sans plage hypoechogène

O
U

Très hypoechogène
Microlithes groupés
Macrocalcifications
Plages hypoechogènes



Forte suspicion de tumeur stromale
(à cellule de Leydig)

Forte suspicion de
Séminome

Surveillance si < 5 mm
Tumorectomie si > 10 mm
Discussion si 5 to 10 mm

Discuter
tumorectomie/orchidectomie
Extemporane : aspect per op

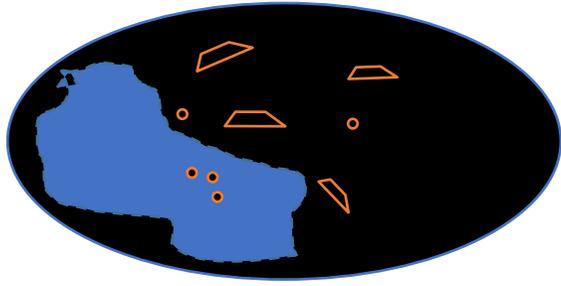


IRM

ADC intermédiaire
AUC +++, courbe de type 2 ou 3

ADC bas < 0,8 (1,5 ou 3T)
AUC +/- courbe de type 1/2/3

BURN OUT TUMORS



plages nodulaire

- Tumeur et testicule sous jacent en involution fibreuse spontanée
- Infertilité secondaire ++ (*azoo ou oligozoo NO sévère ++*) – douleur/gêne testiculaire - révélée par métastases rétroP
- Aspect souvent trompeur pseudo-atrophique : multimodalité
- Challenge diagnostique notamment si révélé lors d'infertilité
- TGS +++ > TGNS – NGIS - ± métastatique au diagnostic



Article

Ultrasound and Magnetic Resonance Imaging of Burned-Out Testicular Tumours: The Diagnostic Keys Based on 48 Cases

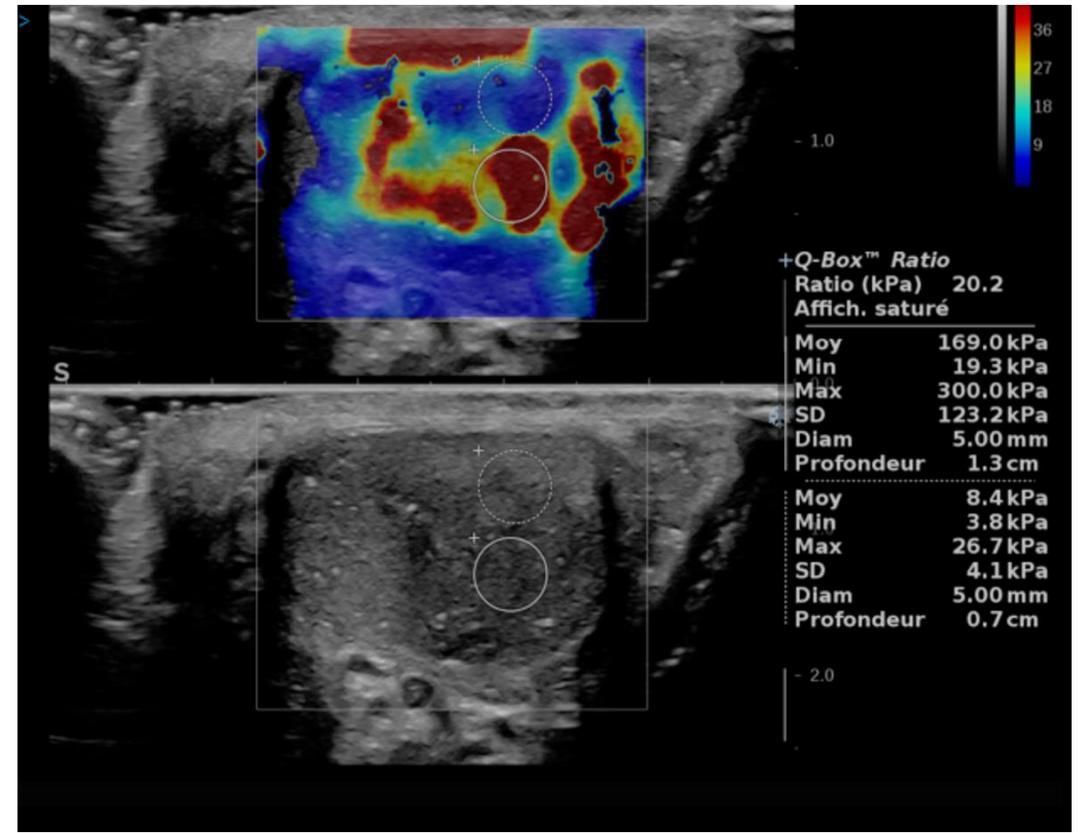
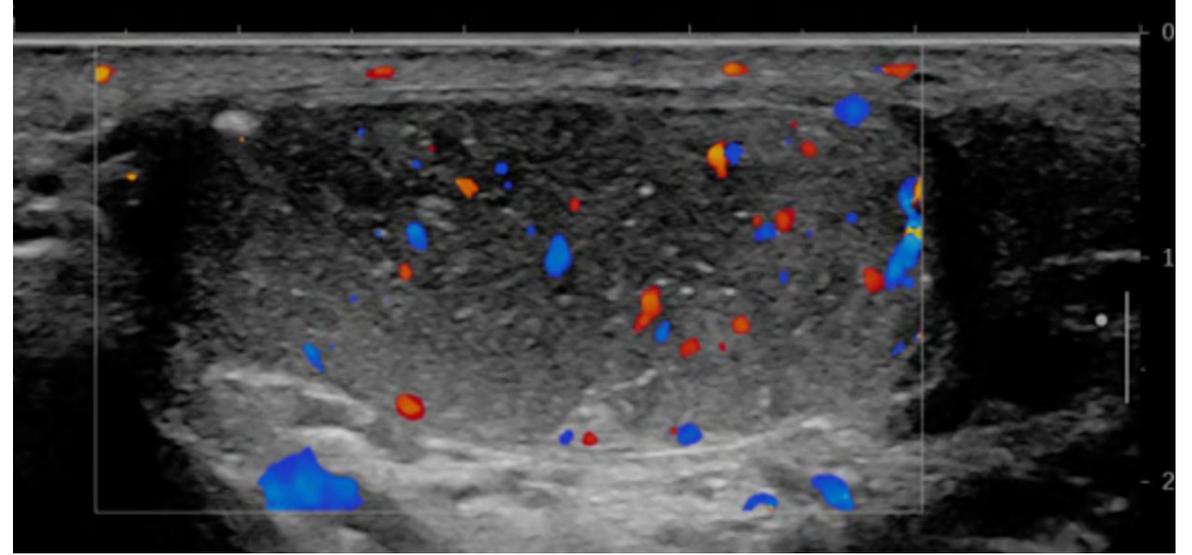
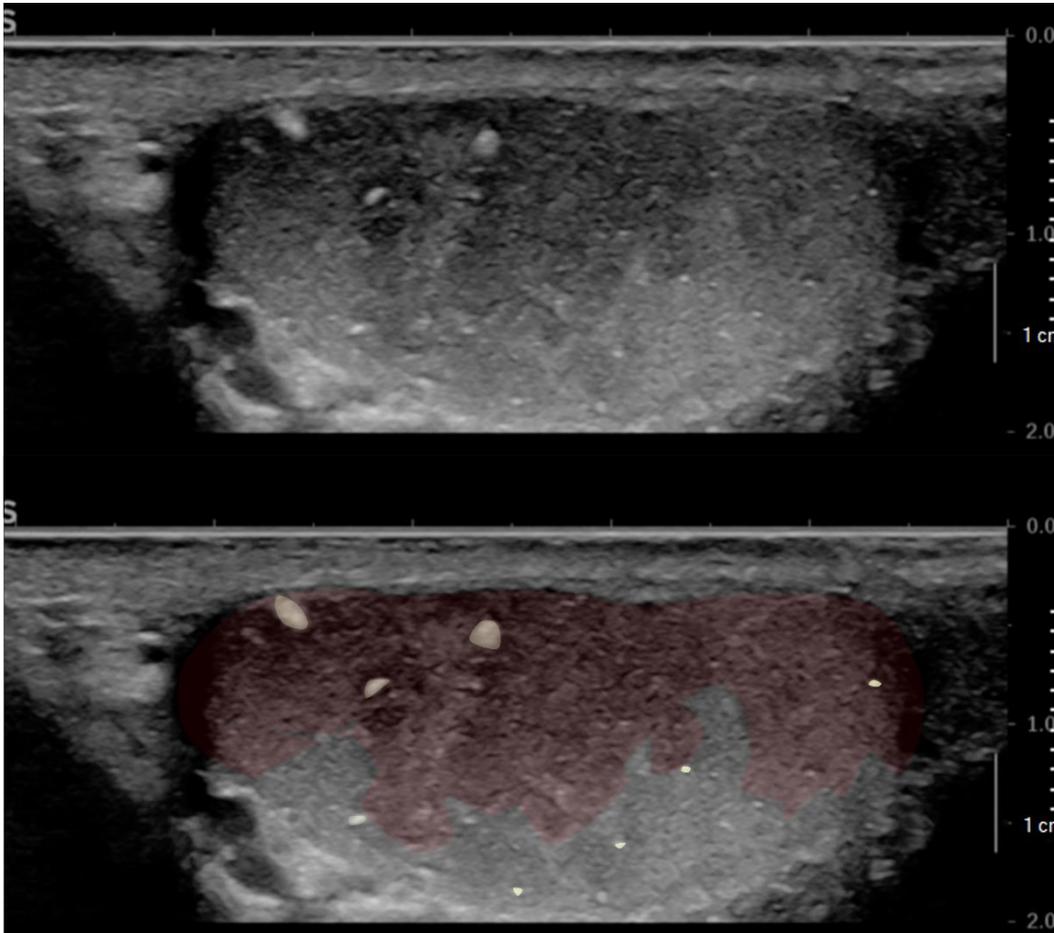
Thomas Desmousseaux^{1,2,*}, Emmanuel Arama^{1,3}, Florian Maxwell², Sophie Ferlicot^{3,4}, Chahinez Hani¹, Karim Fizazi^{3,5}, Cédric Lebacle^{3,6}, Yohann Lorient⁵, Meriem Boumerzoug¹, Julian Cohen¹, Nada Garrouche¹ and Laurence Rocher^{1,3,7,*}

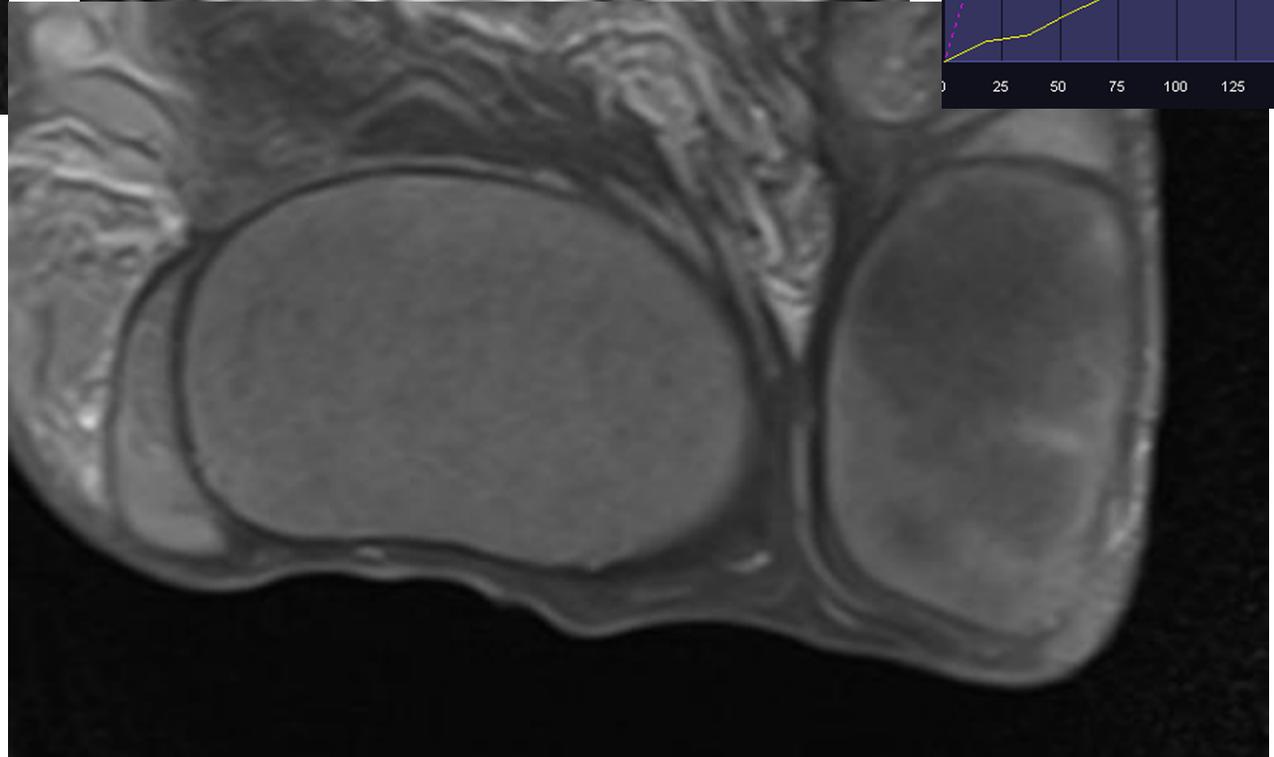
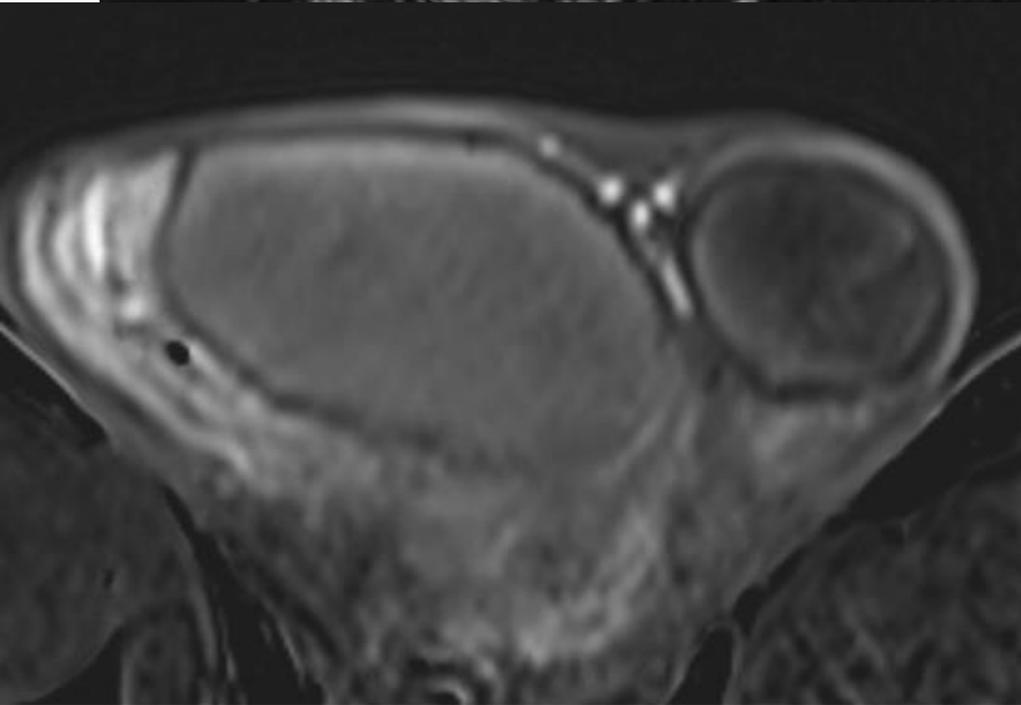
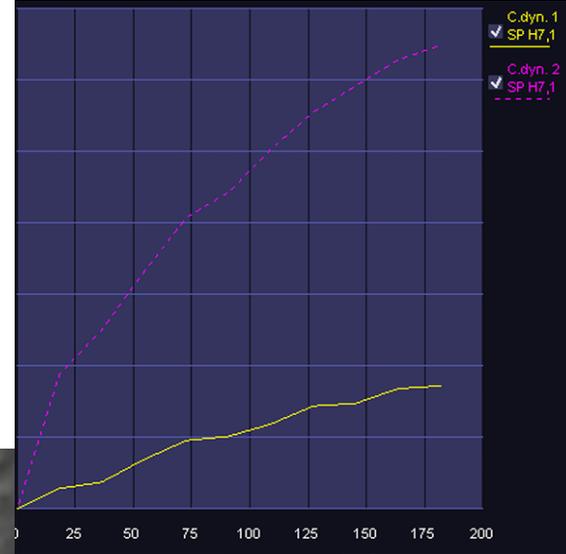
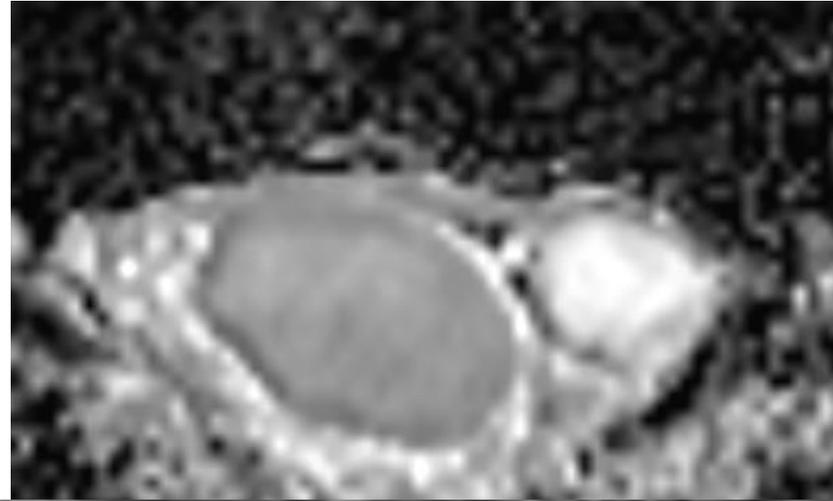
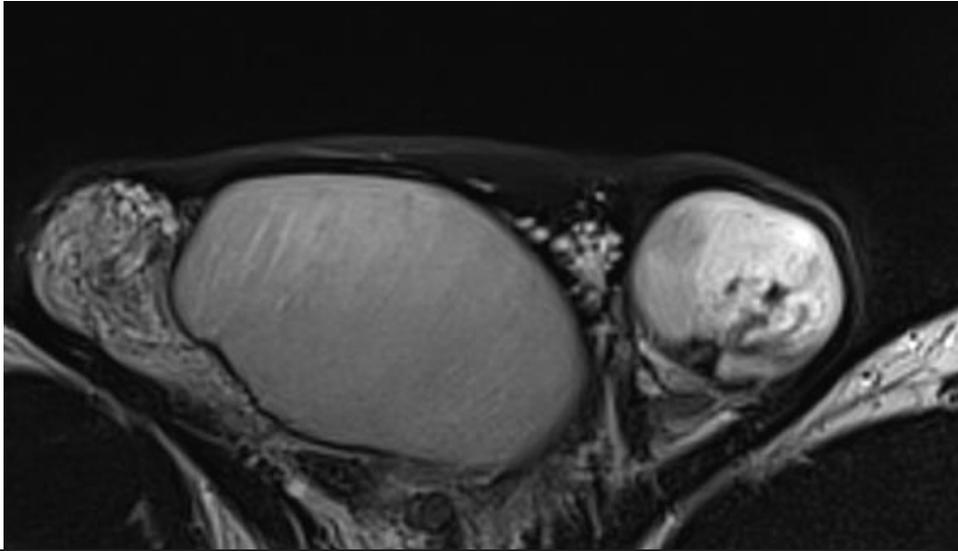
48 Burned Out Tumors
- 27: recherche de primitif devant métastases rétro-péritonéale
- 21 patients : bilan d'infertilité

BURN OUT TUMORS

43 ans, bilan d'infertilité secondaire

- Azoospermie
- Cliniquement : testicule hypotrophique sans masse palpable





VARICOCELE



- Bilatéral
- Position couchée
- Si neg : position debout

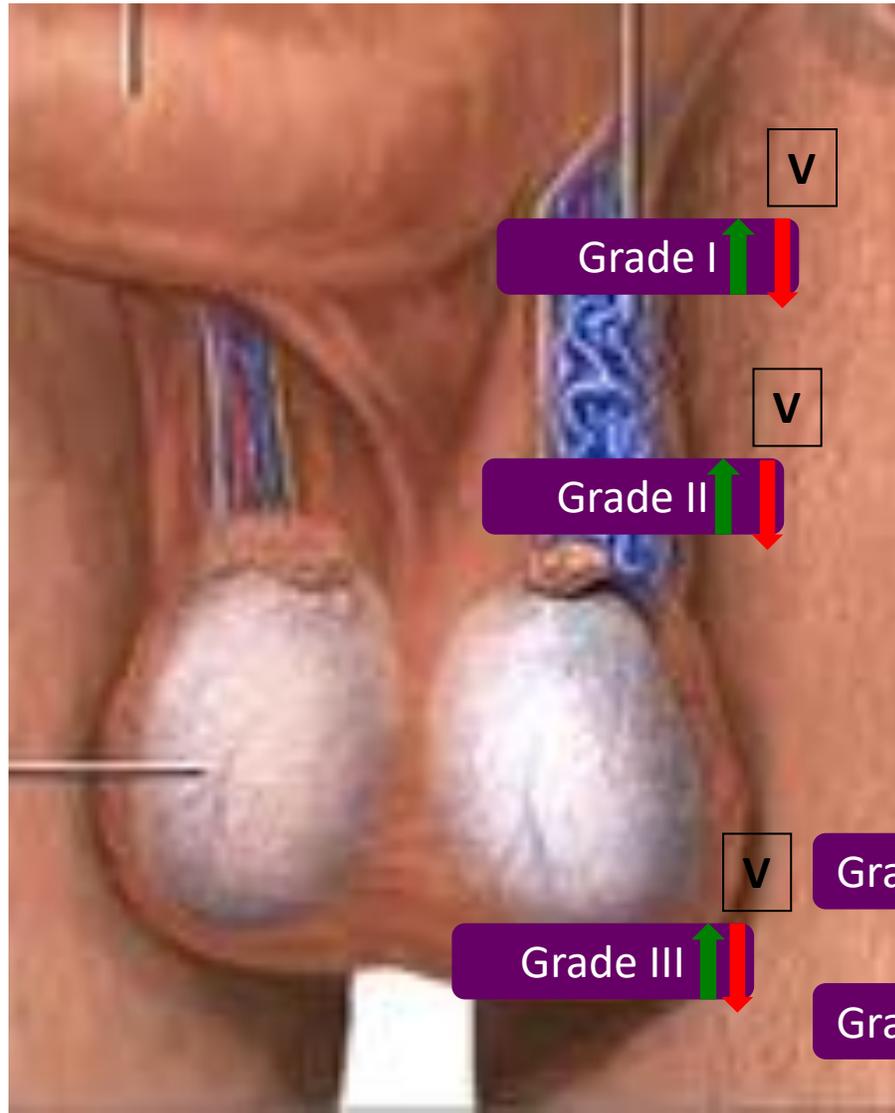
- Examen pôle inférieur testis
- Si neg : examen pole supérieur testis



Valsava efficace = patient motivé

VARICOCELE

Classification Sarteschi



Respi V

Grade IV

Deformation scrotale + Hypotrophie Possible

Grade V

Deformation scrotale + Hypotrophie +

VARICOCELE

REVIEW PAPER



Ultrasound evaluation of varicoceles: systematic literature review and rationale of the ESUR-SPIWG Guidelines and Recommendations

Michele Bertolotto¹ · Simon Freeman² · Jonathan Richenberg³ · Jane Belfield⁴ · Vikram Dogra⁵ · Dean Y. Huang⁶ · Francesco Lotti⁷ · Karolina Markiet⁸ · Olivera Nikolic⁹ · Subramaniyan Ramanathan¹⁰ · Parvati Ramchandani¹¹ · Laurence Rocher^{12,13} · Mustafa Secil¹⁴ · Paul S. Sidhu⁶ · Katarzyna Skrobisz⁸ · Michal Studniarek⁸ · Athina Tsili¹⁵ · Ahmet Tuncay Turgut¹⁶ · Pietro Pavlica¹⁷ · Lorenzo E. Derchi¹⁸ · Members of the ESUR-SPIWG WG

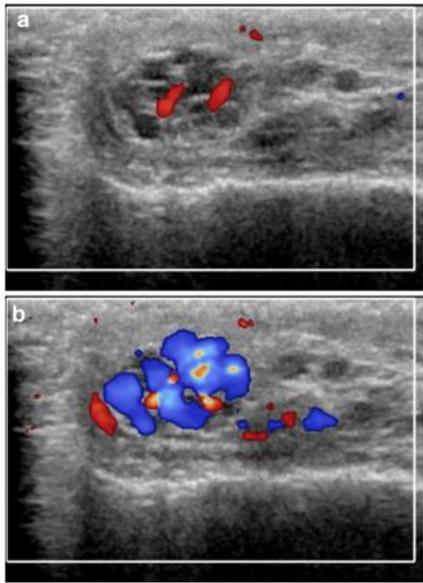


Fig.3 Sarteschi's grade I varicocele. Colour Doppler images obtained at rest (a) and during Valsalva (b) showing dilated veins of the spermatic cord with reflux during Valsalva at the inguinal canal

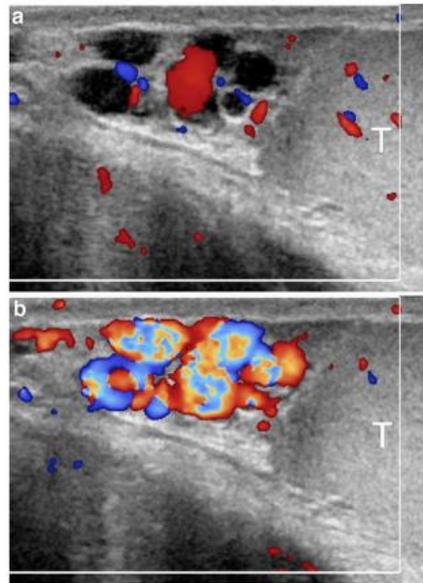


Fig.4 Sarteschi's grade II varicocele. Colour Doppler images obtained at rest (a) and during Valsalva (b) showing dilated veins in the suprastesticular region with reflux during Valsalva (T=testis)

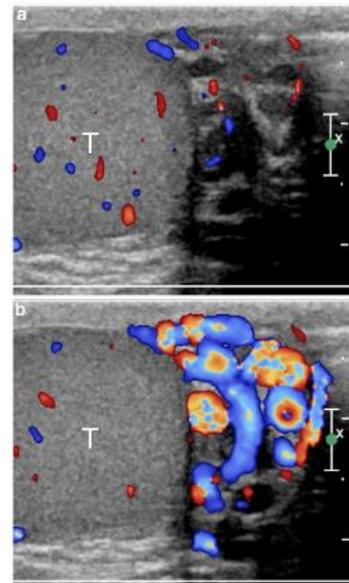


Fig.5 Sarteschi's grade III varicocele. Colour Doppler images obtained at rest (a) and during Valsalva (b) showing dilated veins to the interior pole of the testis (T) with reflux during Valsalva

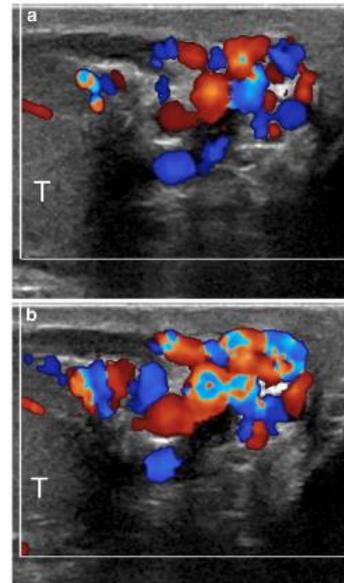
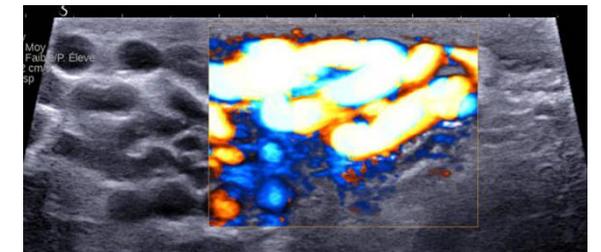
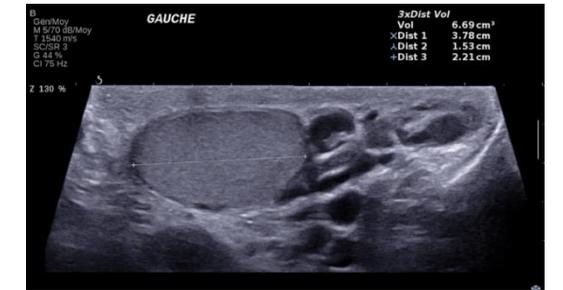


Fig.6 Sarteschi's grade IV varicocele. Colour Doppler images obtained in supine position at rest (a) and while standing during Valsalva (b). Dilated veins with reflux are visible also at rest. Reflux increases while standing during Valsalva (T=testis)

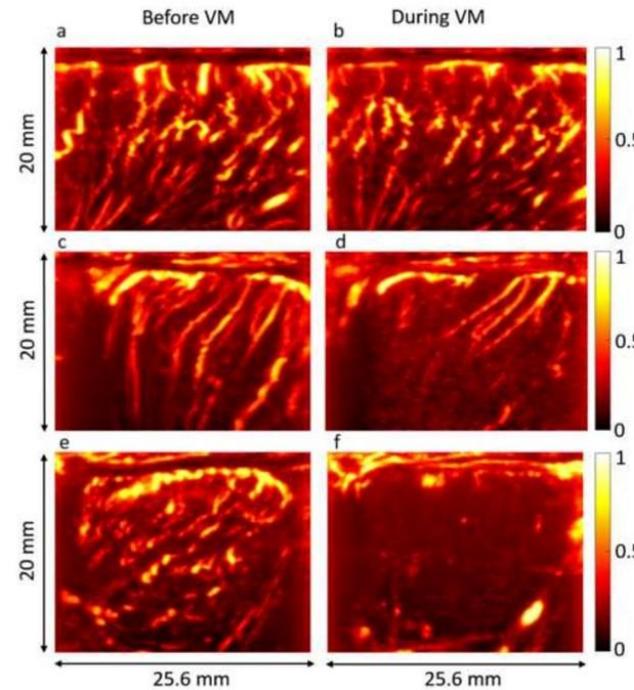


VARICOCELE

Doppler ultrasensible
 Ischémie testiculaire durant le reflux
 Argument en + pour ttt

Figure 2

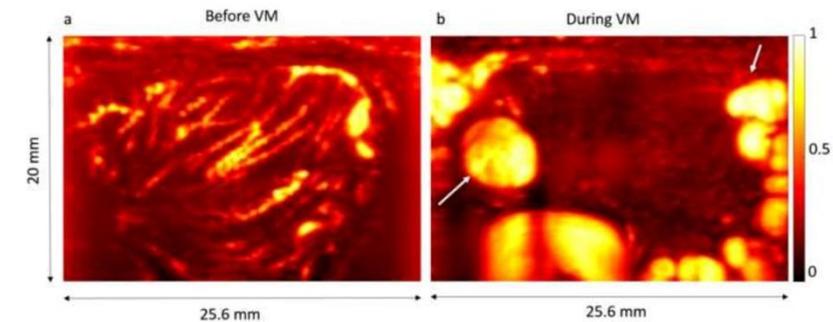
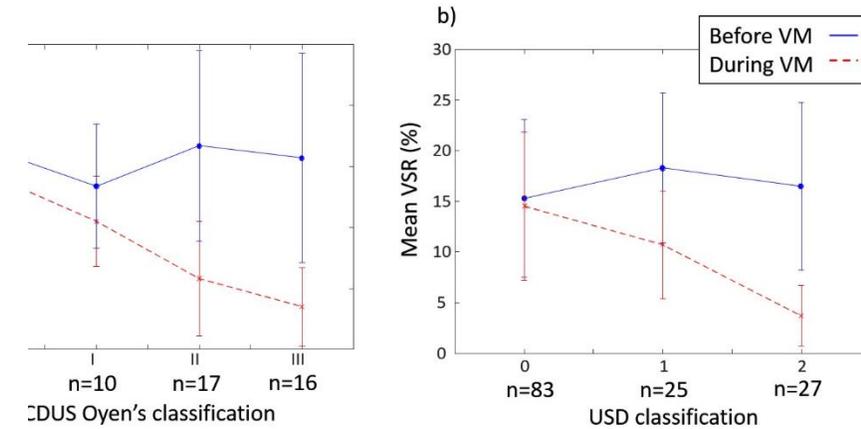
[Click here to download Figure Fig 2.tif](#)



> Acta Radiol. 2019 Aug;60(8):1048-1056. doi: 10.1177/0284185118810981. Epub 2018 Nov 5.

Ultrasensitive Doppler as a tool for the diagnosis of testicular ischemia during the Valsalva maneuver: a new way to explore varicoceles?

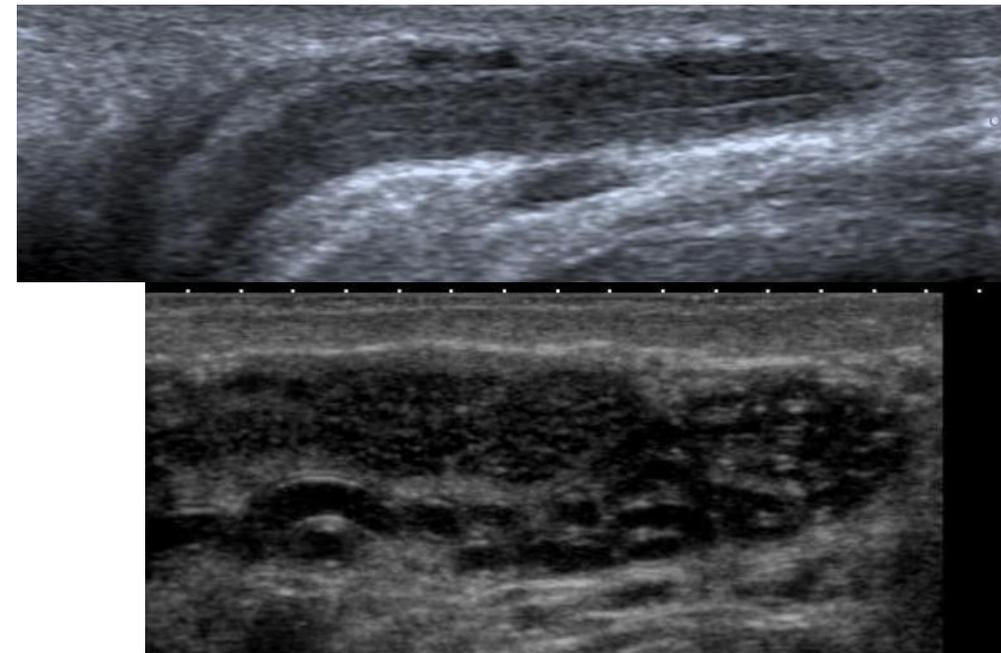
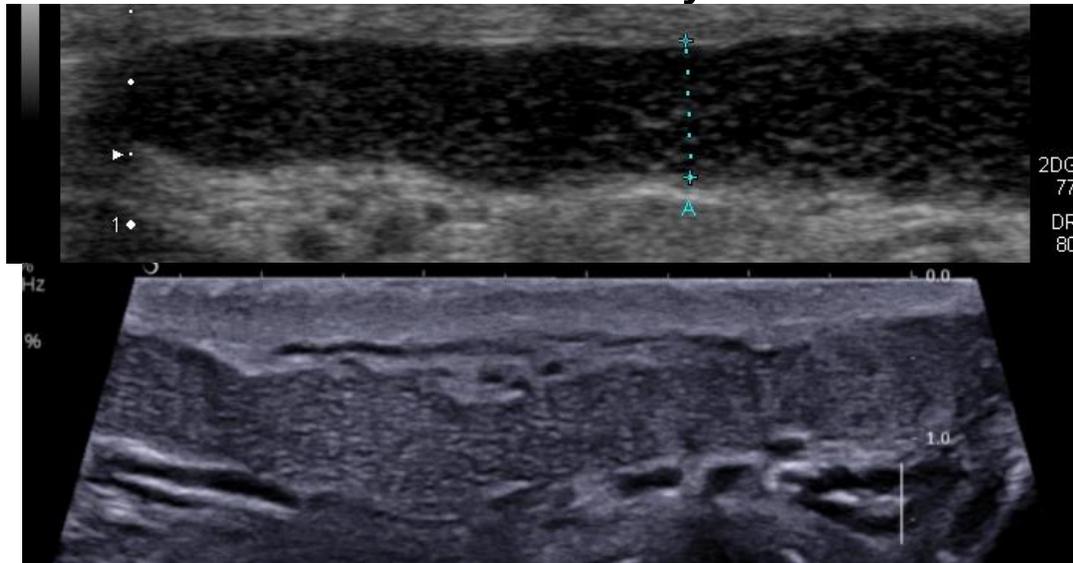
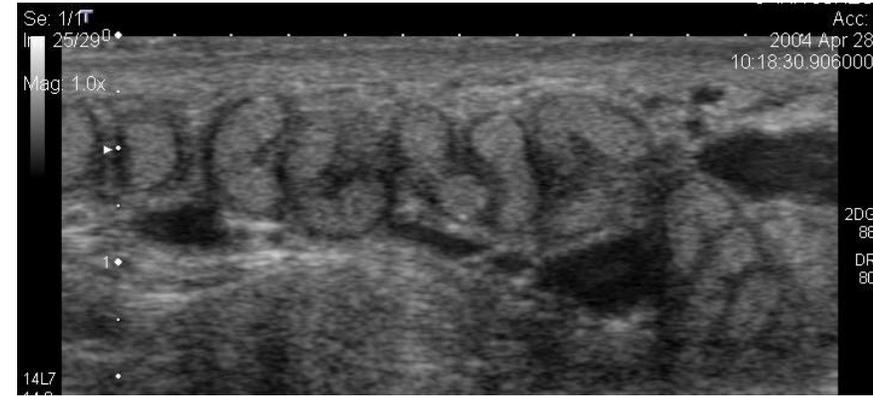
Laurence Rocher^{1 2 3 4}, Jean-Luc Gennisson^{3 4}, Jérôme Baranger³, Antoine Rachas⁵,
 Aline Criton⁶, Vincent Izard⁷, Michele Bertolloto⁸, Marie-France Bellin^{1 2 4},
 Jean-Michel Correas^{3 9 10}



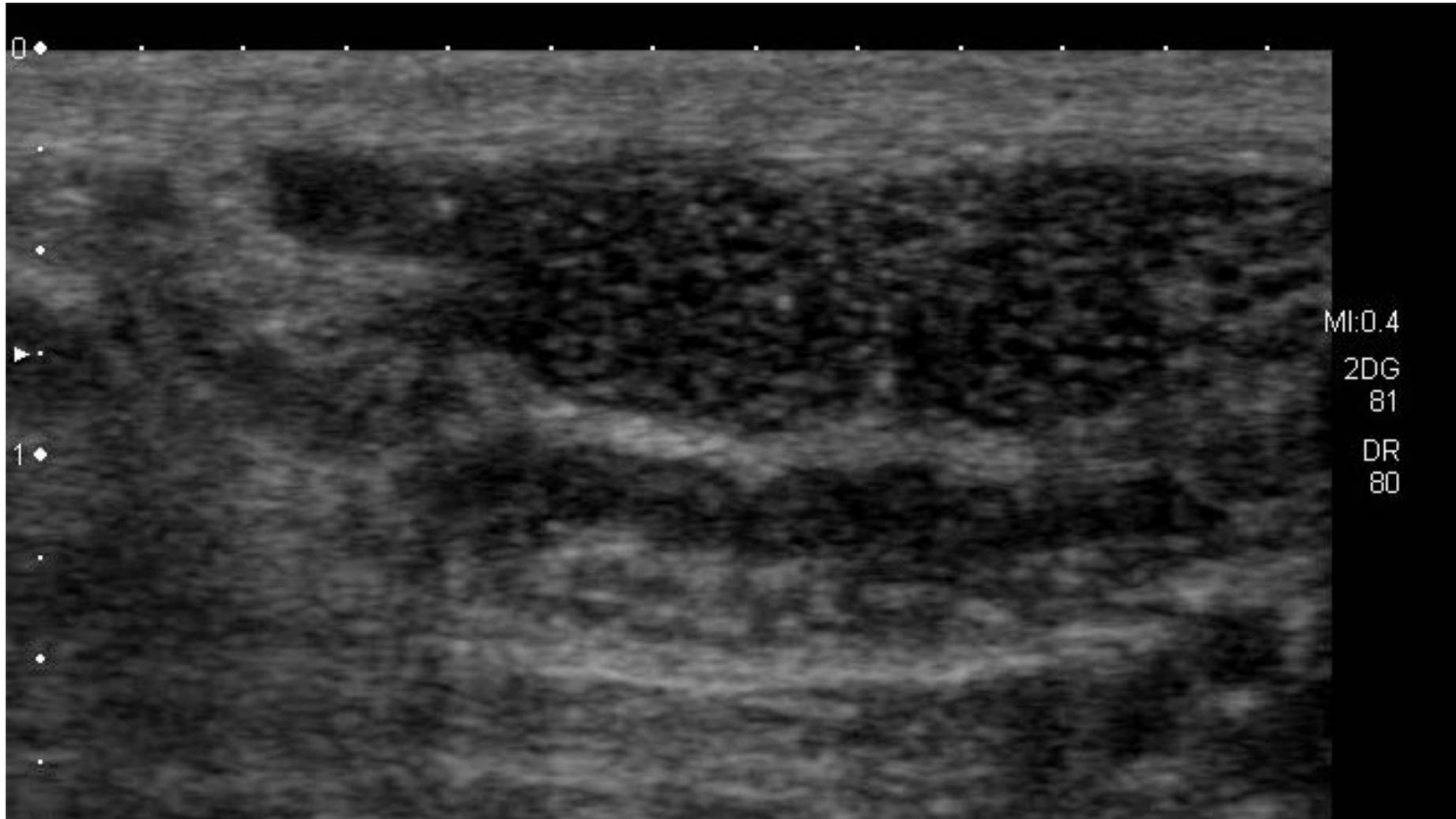
CAUSE OBSTRUCTIVE

Savoir reconnaître une ectasie tubulaire !

- Post infectieuse: concretions calcifications
- ABCD
- Post chirurgie : hernioraphie inguinale, cure d'hydrocele, exérèse de kyste epididymaire...
- Vasectomie bilatérale intentionnelle
- Sténoses des canaux éjaculateurs



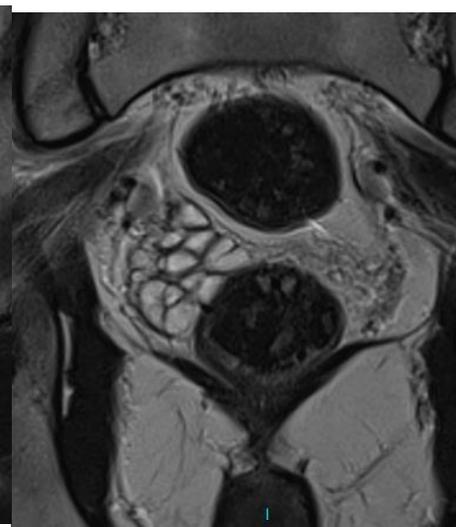
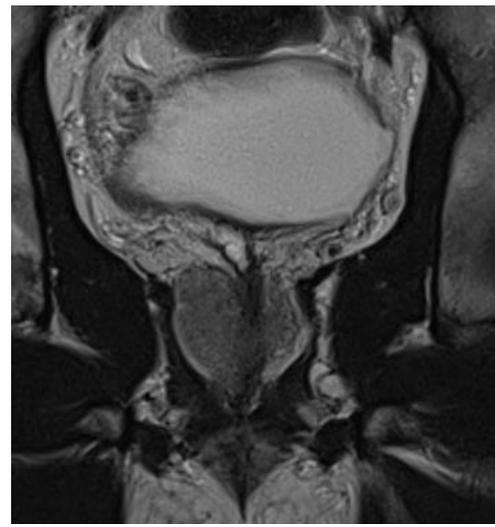
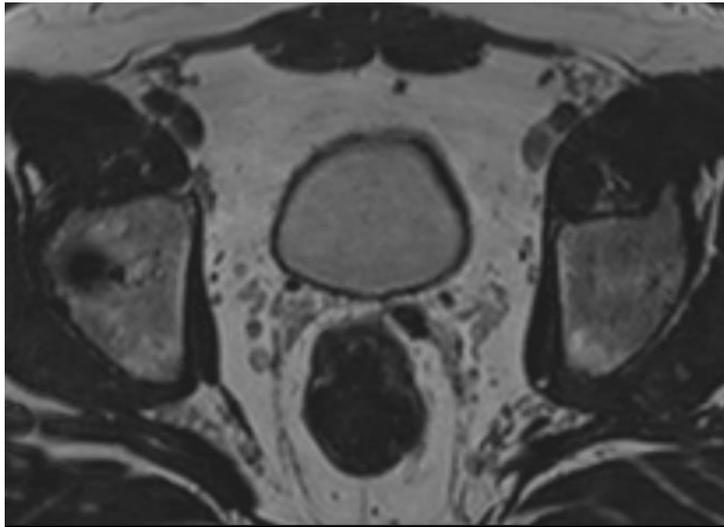
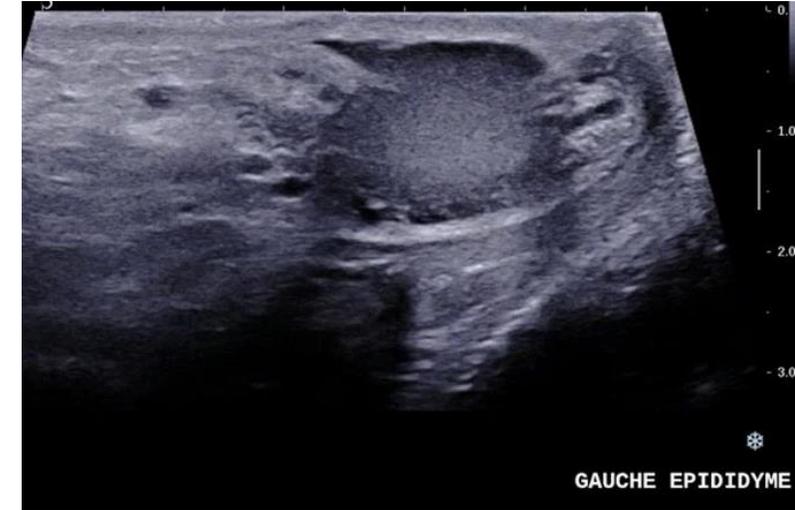
CAUSE OBSTRUCTIVE



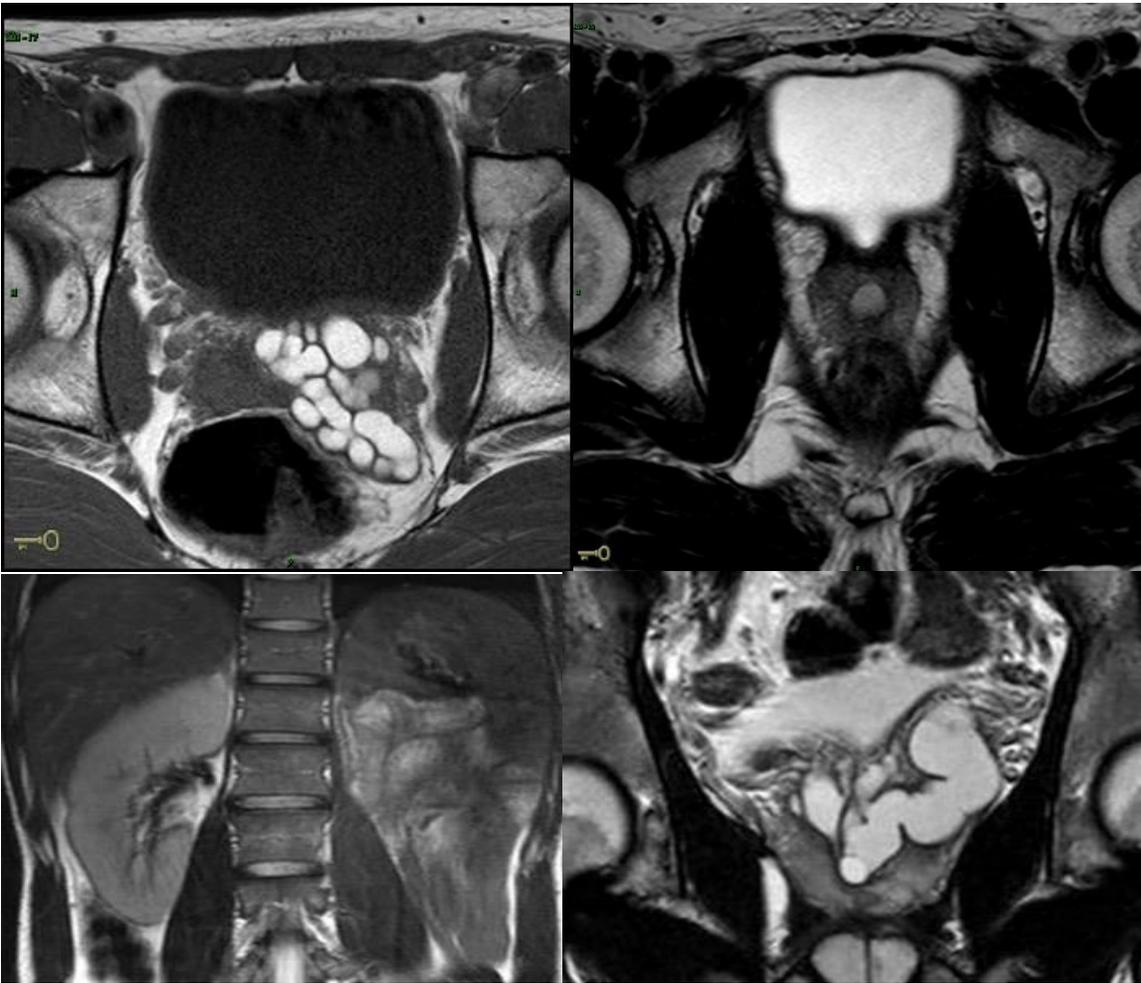
CAUSE OBSTRUCTIVE

Absence bilatérale des conduits déférents (ABCD)

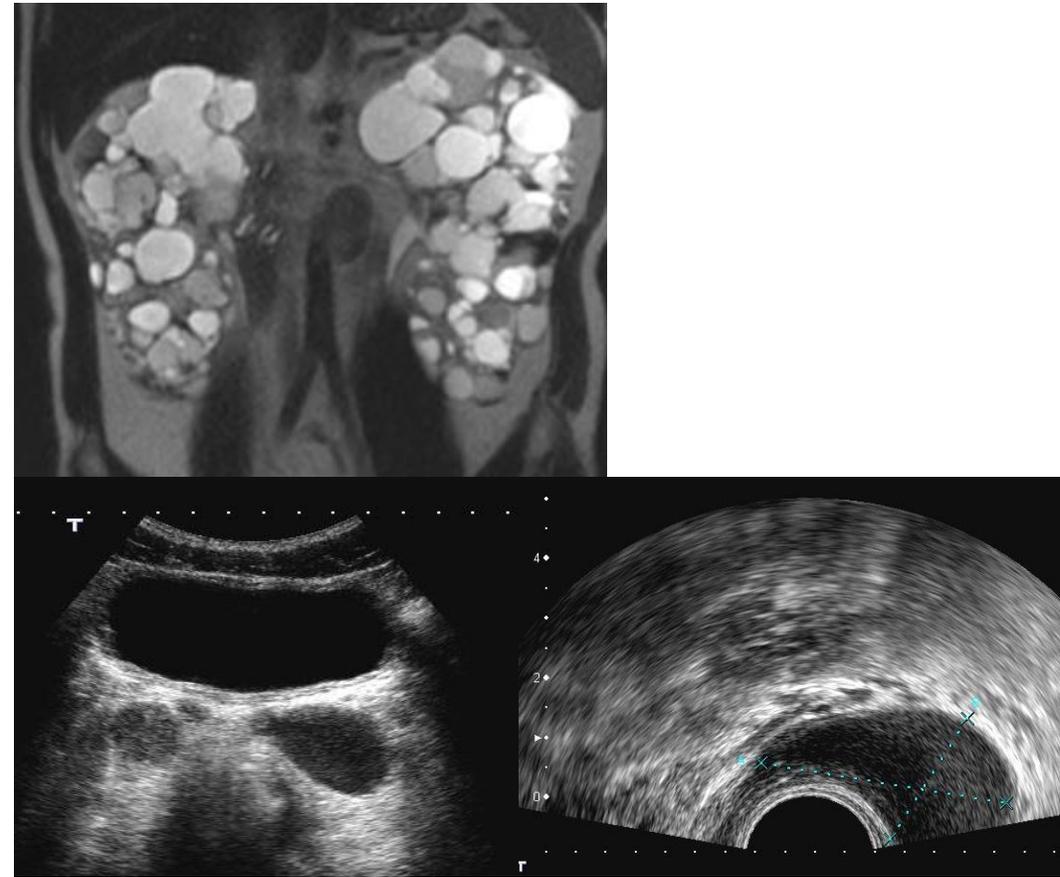
- Conseil génétique et **rechercher mutation CFTR ++** (prévention)
- \pm associée absence des VS
- Tableau d'azoospermie avec hypospermie et pH séminal bas
- Bilan ABCD Mr (CFTR ch.7, voire ADGRG2 ch.X & SLC9A3 ch.5)
- Bilan complet CFTR partenaire



CAUSES OBSTRUCTIVES

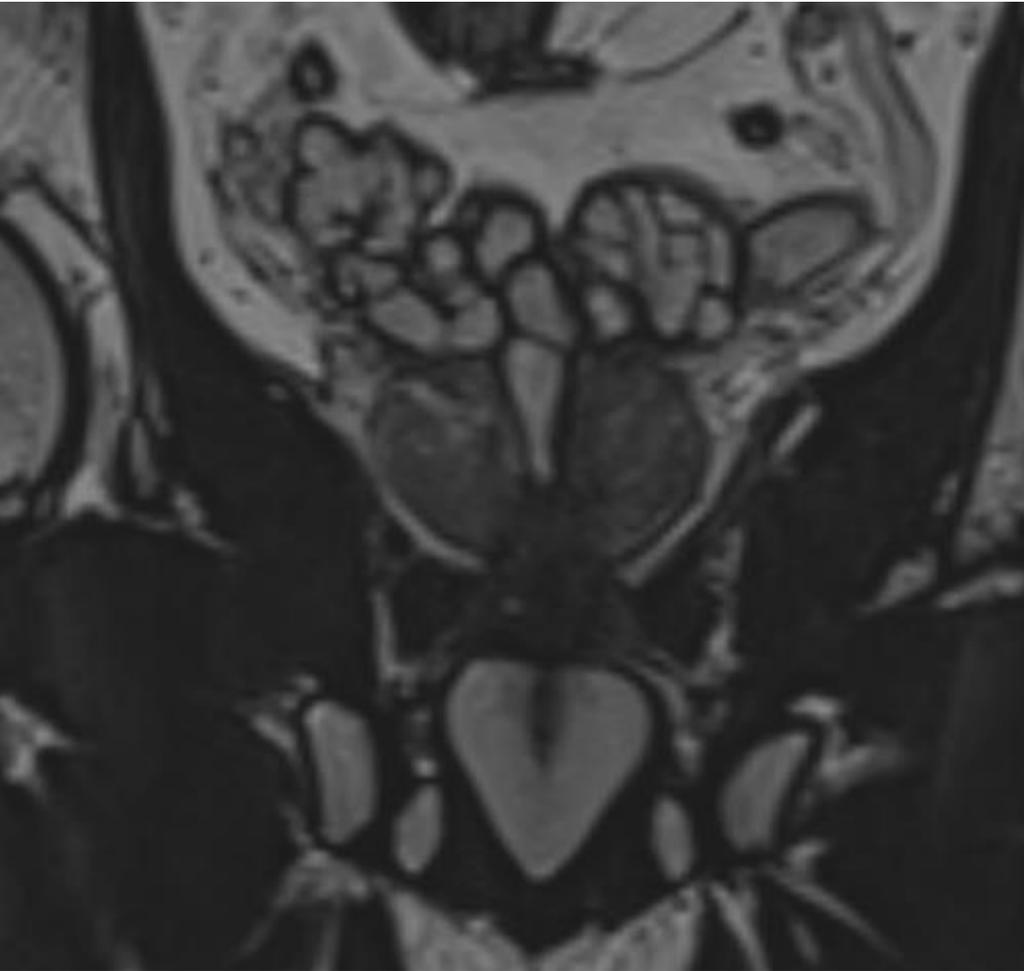


syndrome de Zinner (AUCD & agénésie rénale homolatérale)

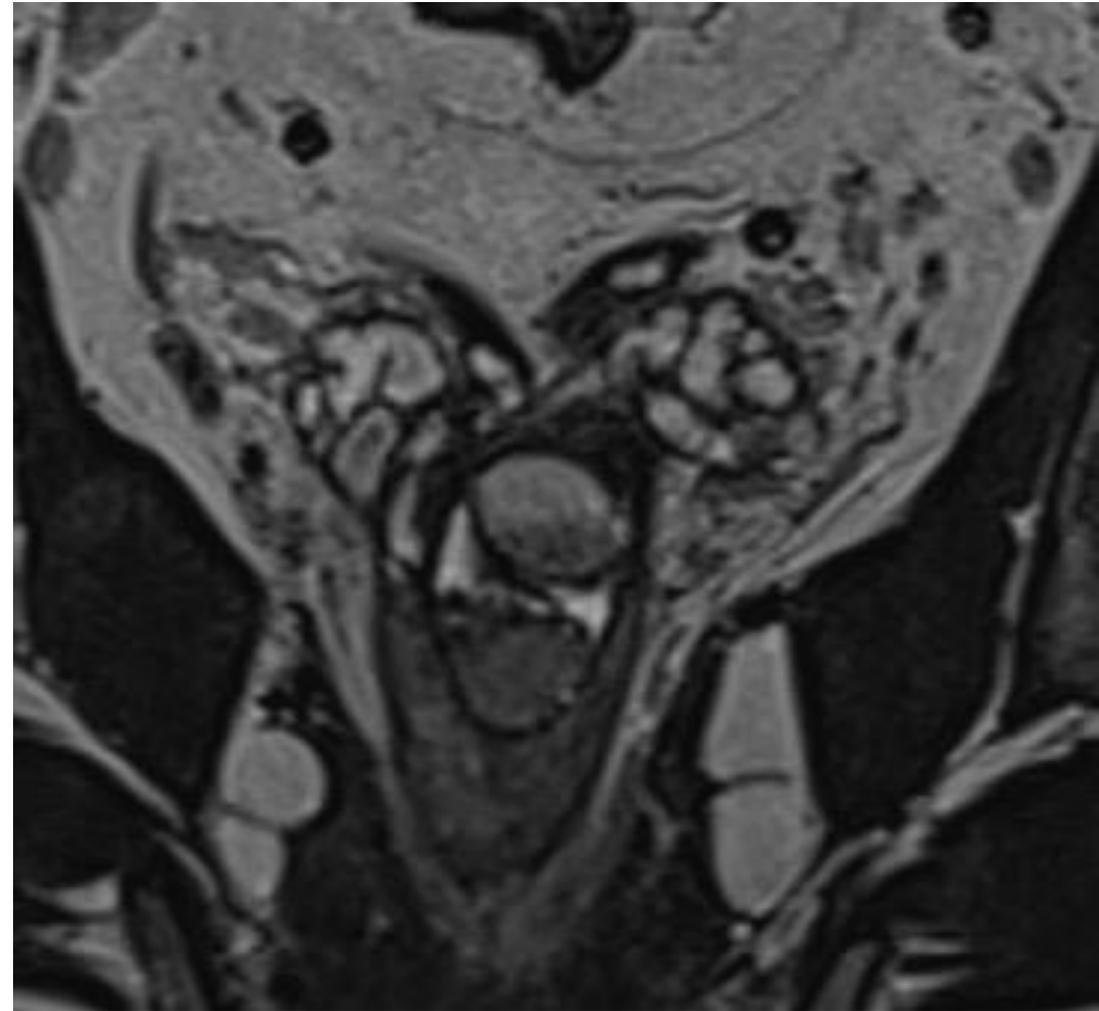


PKR

CAUSES OBSTRUCTIVES



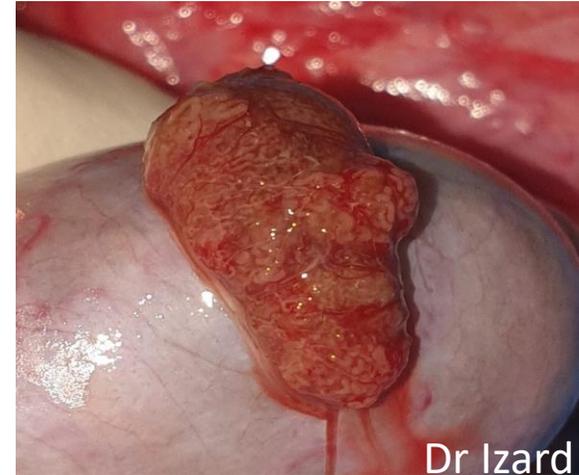
Obstruction des CE



Kystes médian prostatiques

MESSAGES A RETENIR

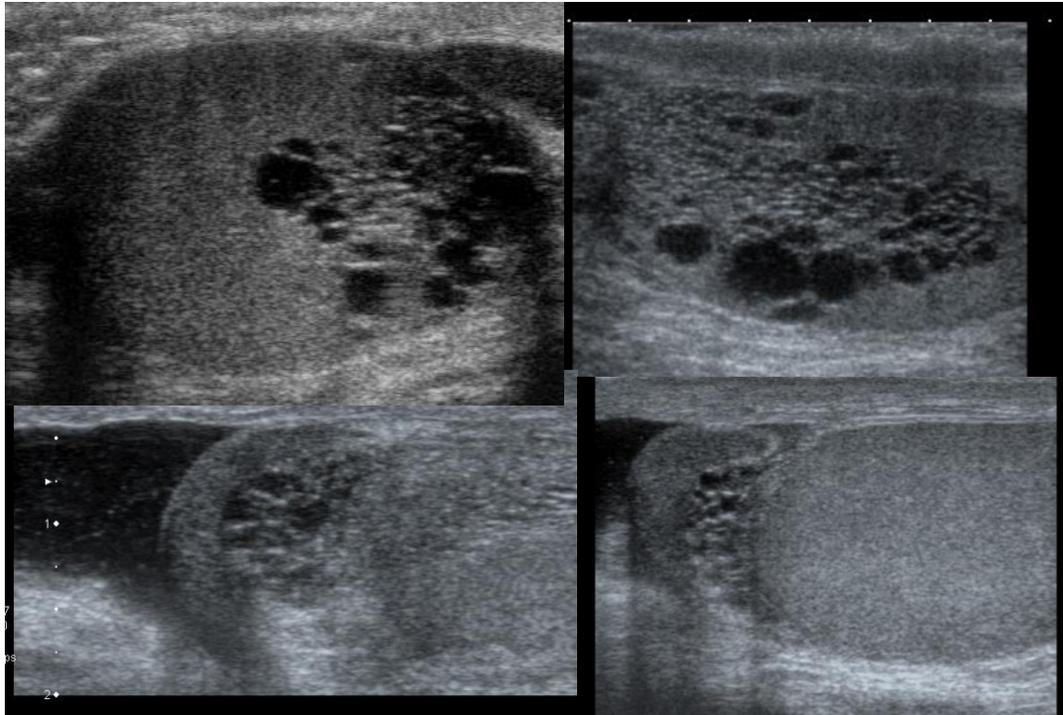
- Renseigner données cliniques / Statut PMA / Spermo
- Identifier causes obstructives et niveau obstacle → IRM
- Identifier anomalies NOA et guider la biopsie testiculaire
- Diagnostiquer les varicocèles et suggérer une prise en charge
- Caractériser les micronodules et suggérer une prise en charge → IRM



Merci de votre attention!

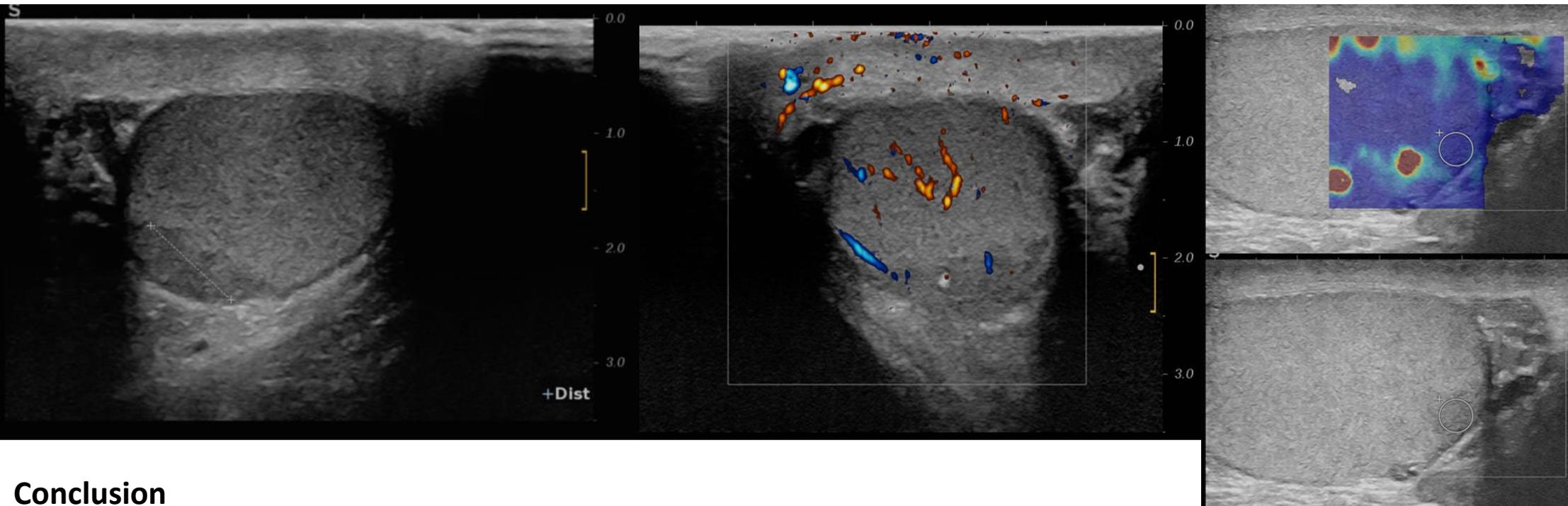
CAUSE OBSTRUCTIVE

Sténoses des cônes efférents : exceptionnel....



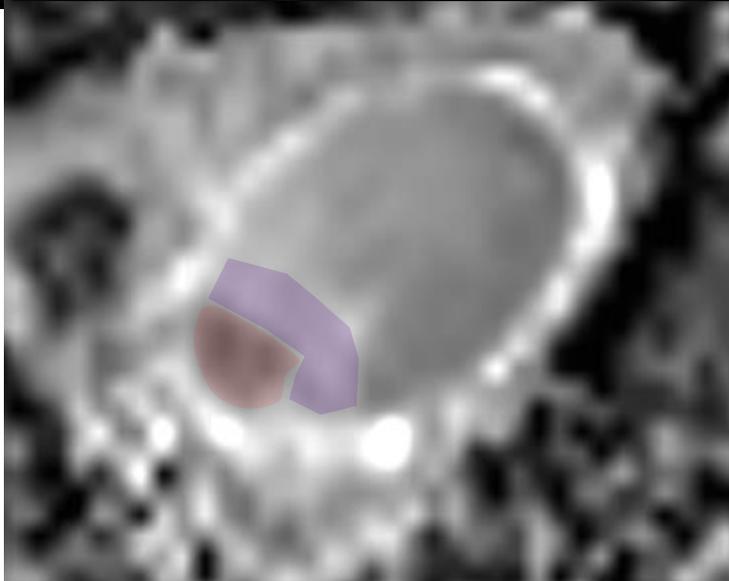
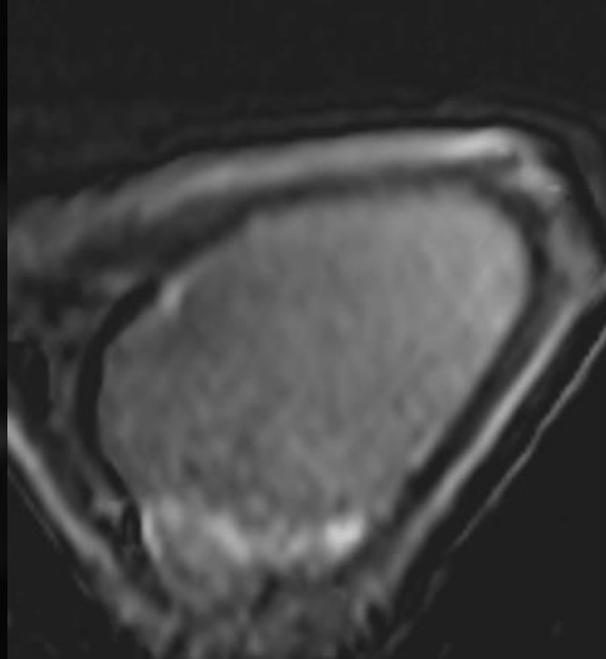
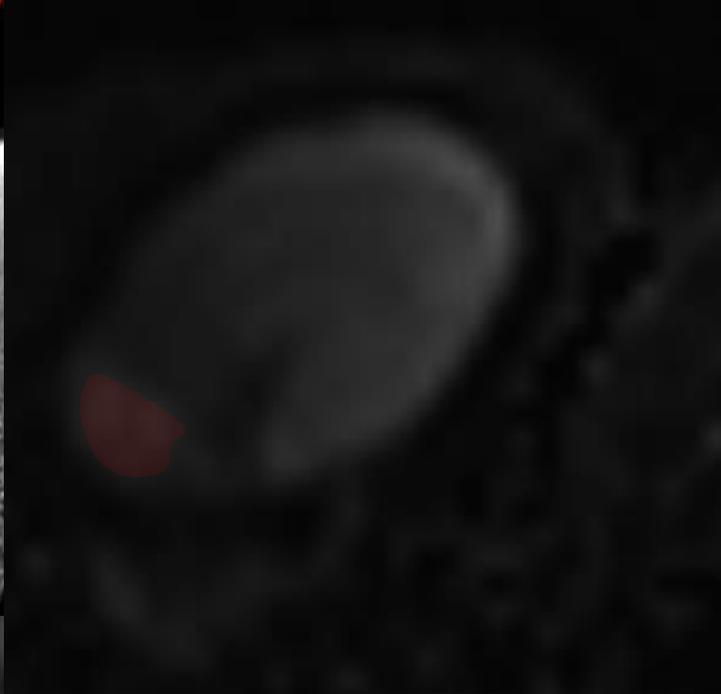
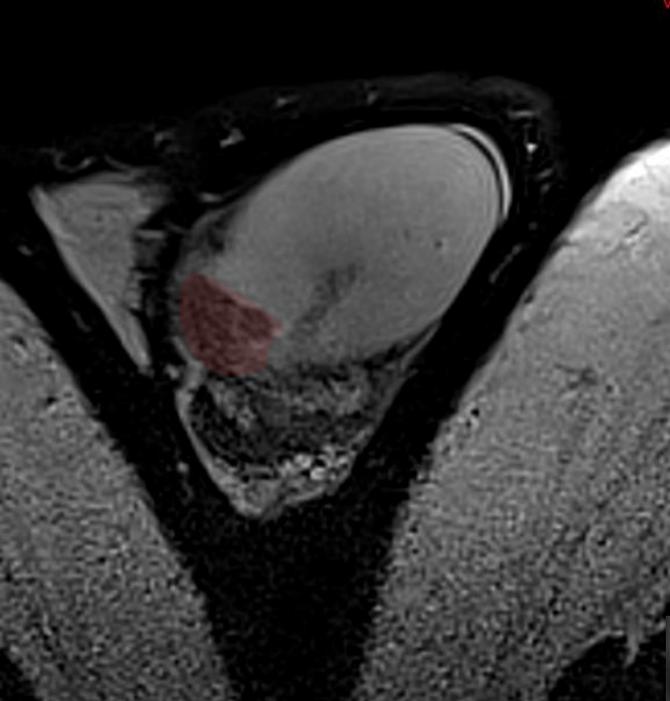
ALTERATION FOCALE PULPE

Douleurs Scrotales aigues



Conclusion

Plage hypodense testiculaire gauche polaire inférieur sous albuginée, centrée par une macrocalcification, non vascularisée, molle en élastographie, mesurant 15 mm de grand axe pouvant être de nature séquellaire, à **corrélér aux données d'une IRM testiculaire.**



CONCLUSION

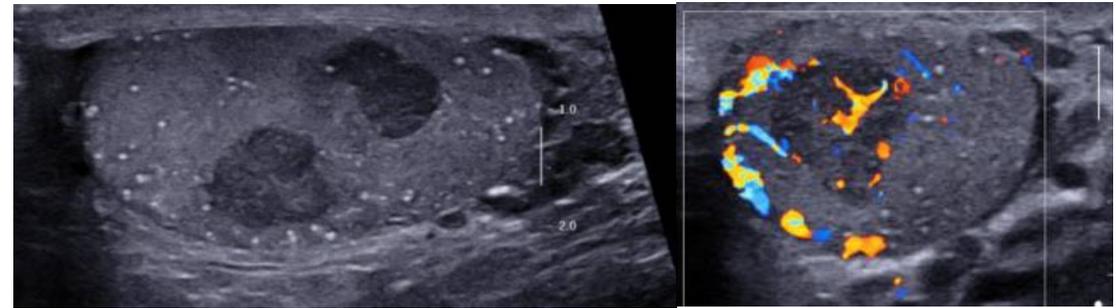
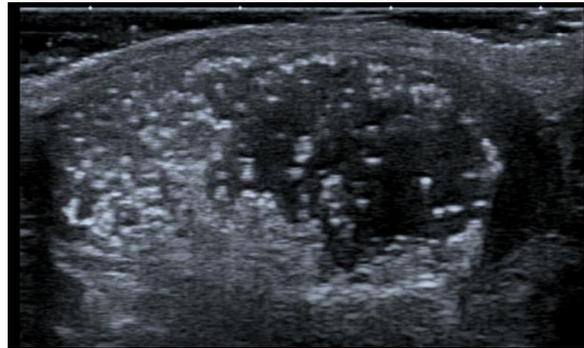
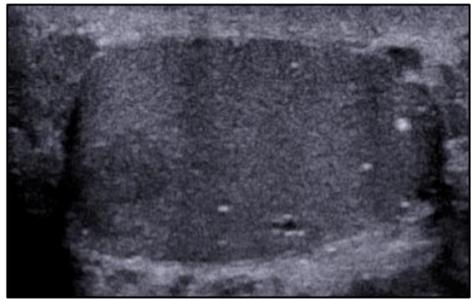
Nodule sertolien de 14 mm de grand axe.

Adénome de Pick

MICROLITHIASE

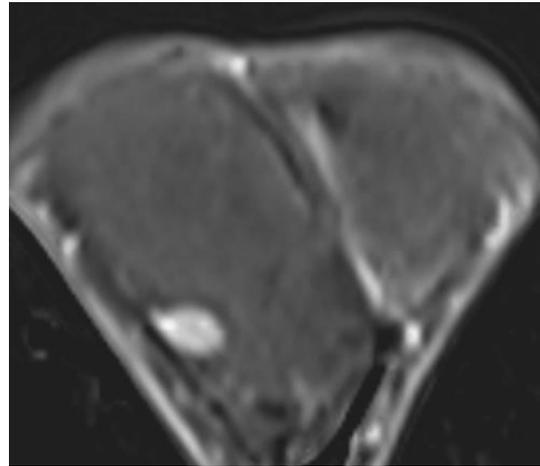
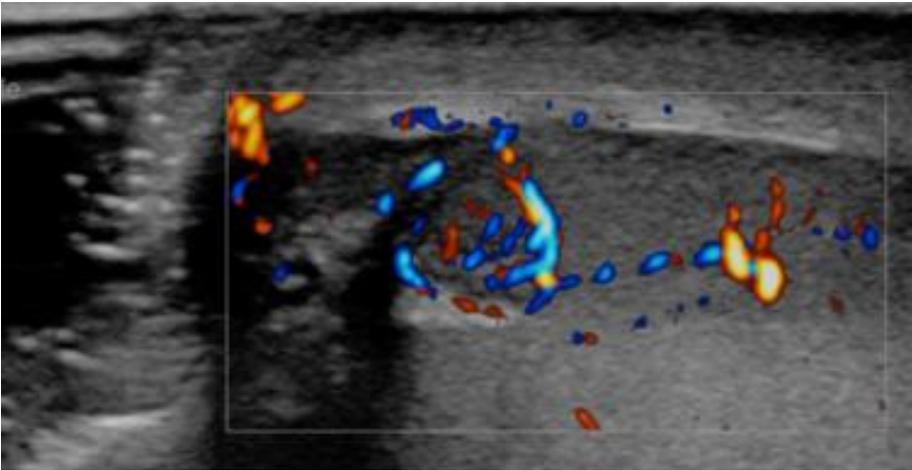
- Syndrome de Klinefelter (1/3 des cas)
- Mac Cune Albright
- Down

Microlithiase et lésion intratesticulaire : tumeur germinale suspecte

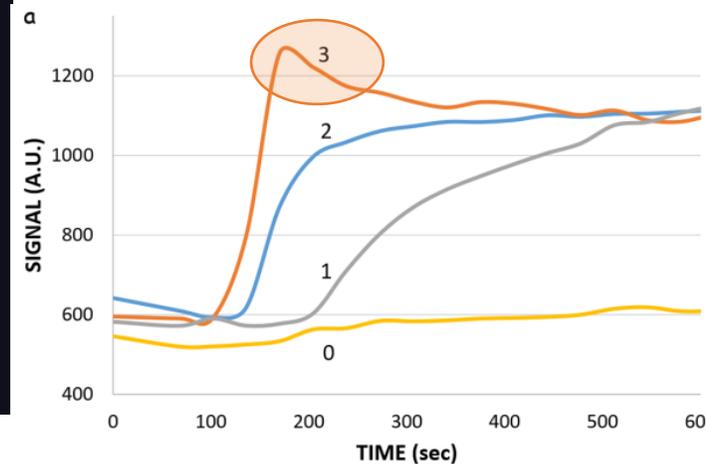
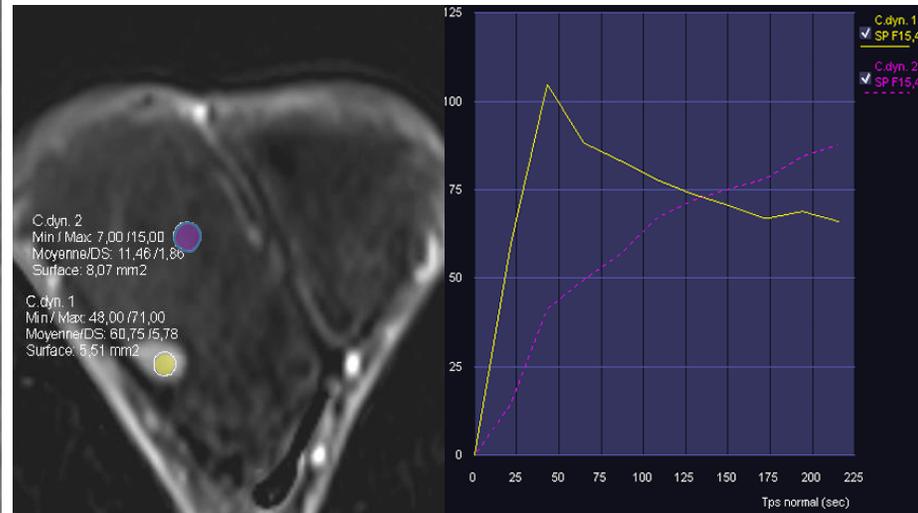
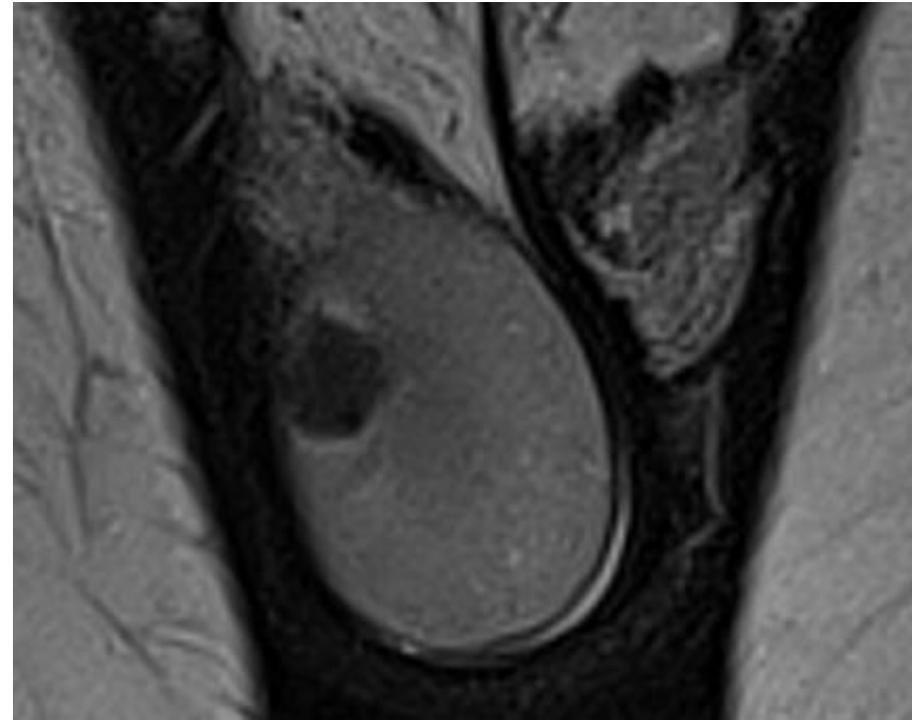


MICRONODULES

Tumeur à cellules de Leydig / Leydigome

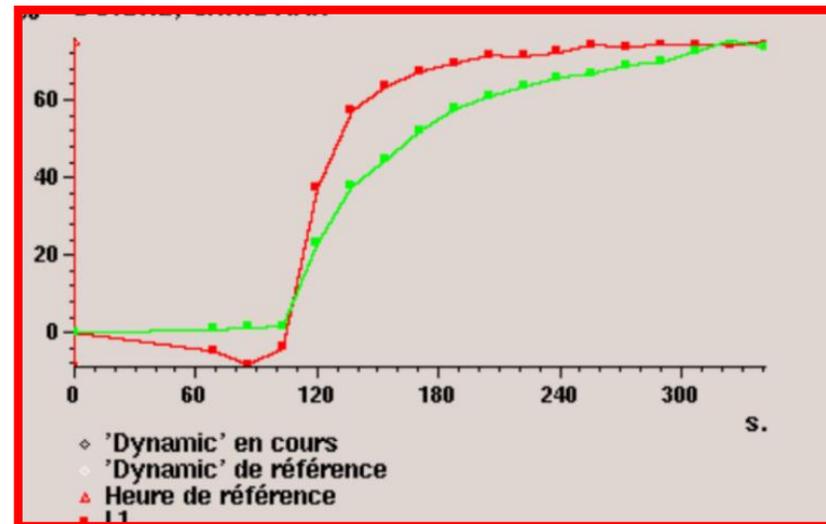
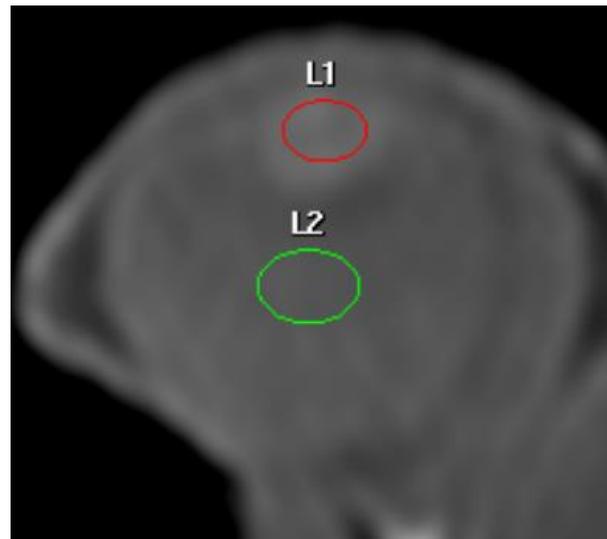
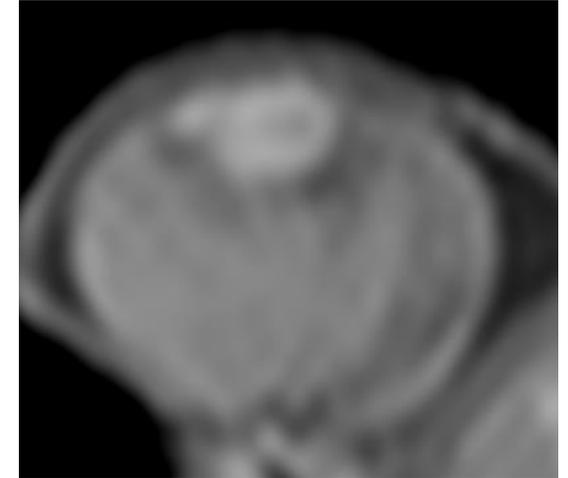
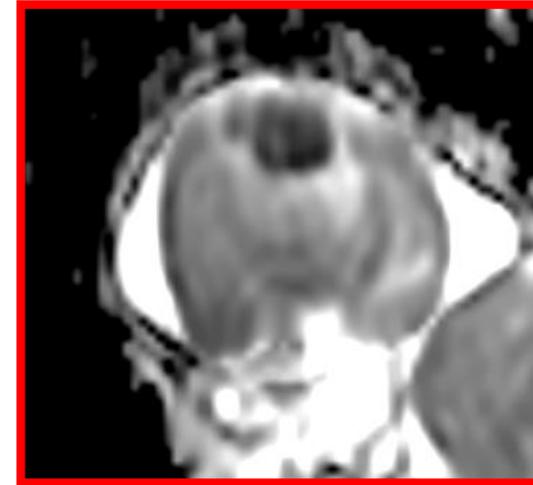
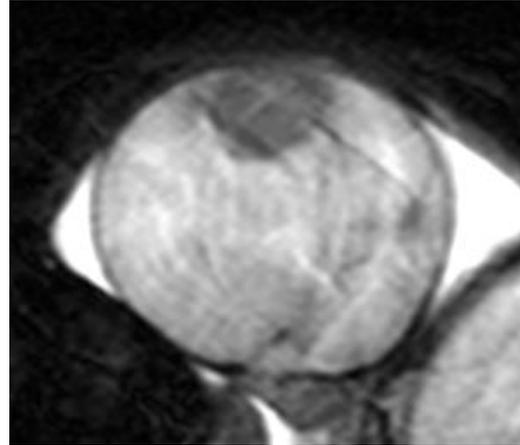
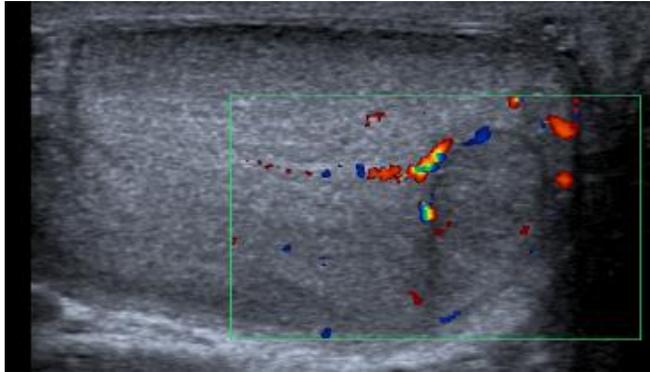


- Diffusion et ADC intermédiaire => **restriction peu marquée ++**
- Réhaussement rapide avec pic précoce – aire sous la courbe élevée > pulpe (**courbe type III**)
- **Wash out** (post gado)



MICRONODULES

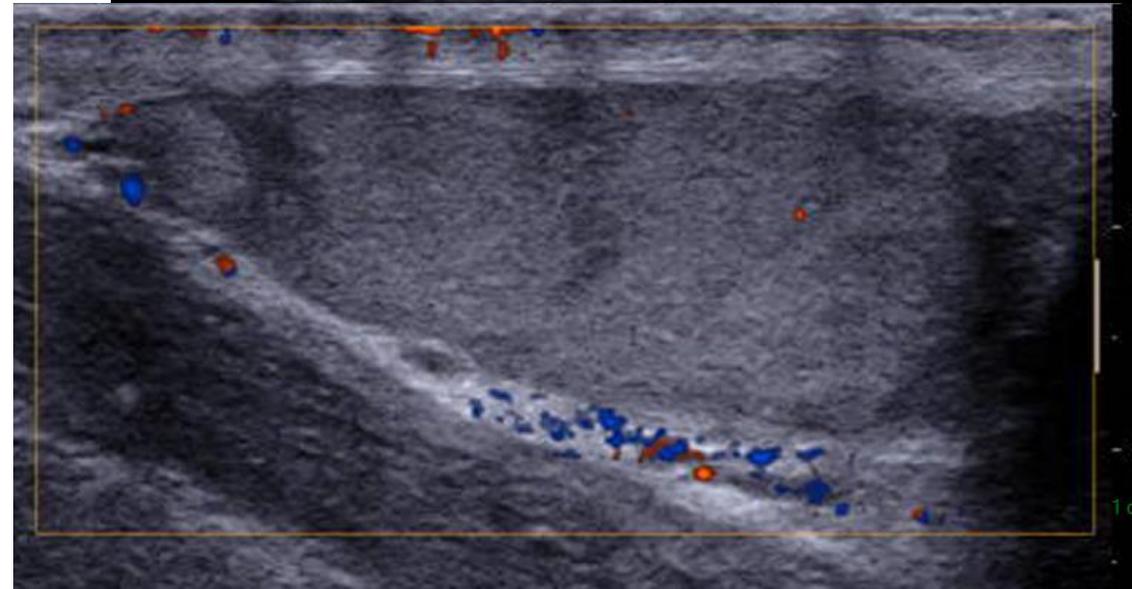
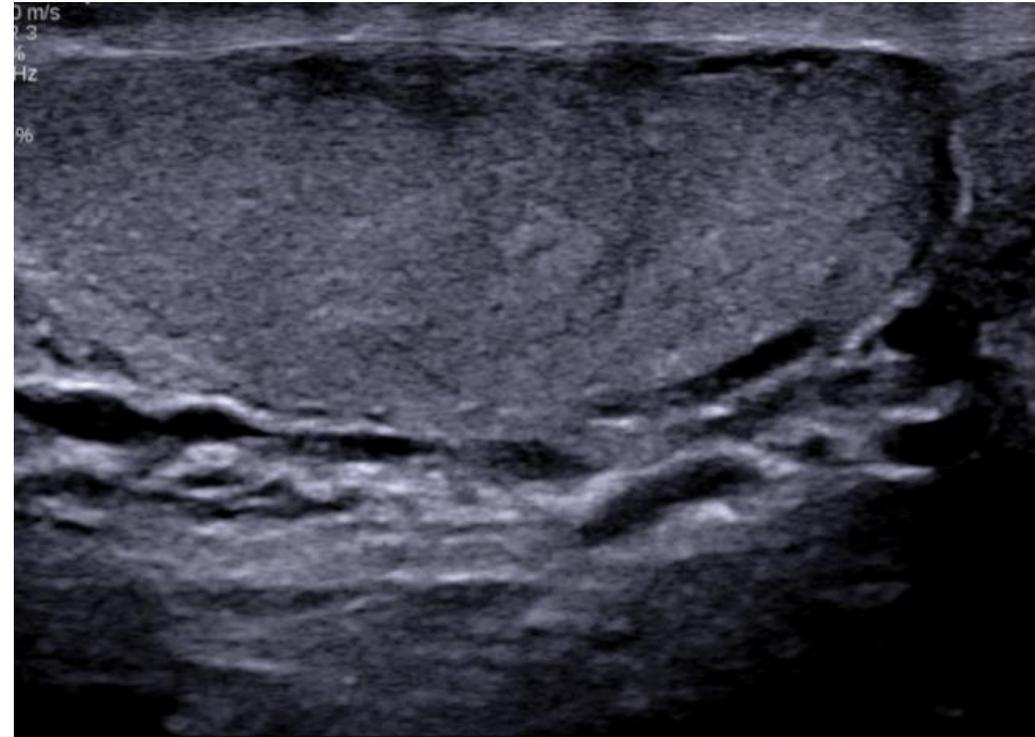
Séminome



HYPOTROPHIE ? ALLEZ PLUS LOIN !

ANOMALIES ACQUISES

- **Chimio – radiothp**
- **Infection**
- **Sans cause évidente retrouvée**
- **Pulpe hétérogène fibreuse**
- **Plutôt hypovasculaire ©**



CAUSE OBSTRUCTIVE

ux éjaculateurs : 35 ans, en
ans, azoospermie, hypospermie

