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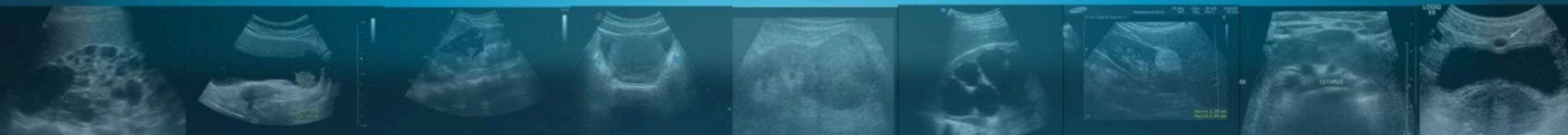
GENITOURINARY CASE PRESENTATION

FELIX CHRISTIAN S. SALANDANAN MD DPBR
PERPETUALHELPMEDICALCENTER - LASPIÑAS



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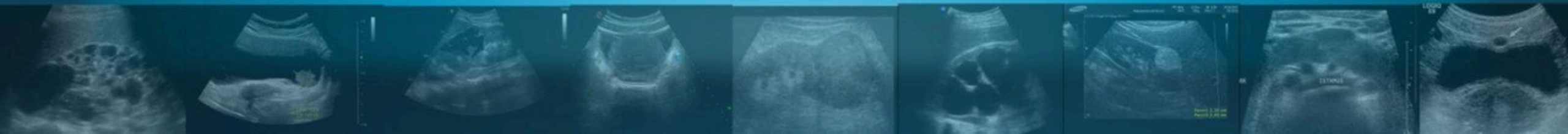
Case #1



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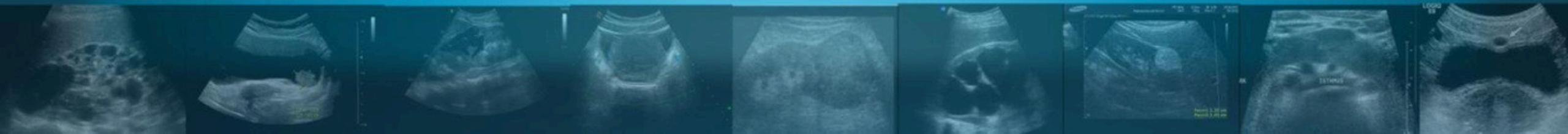
INCREASED CREATININE

61/F



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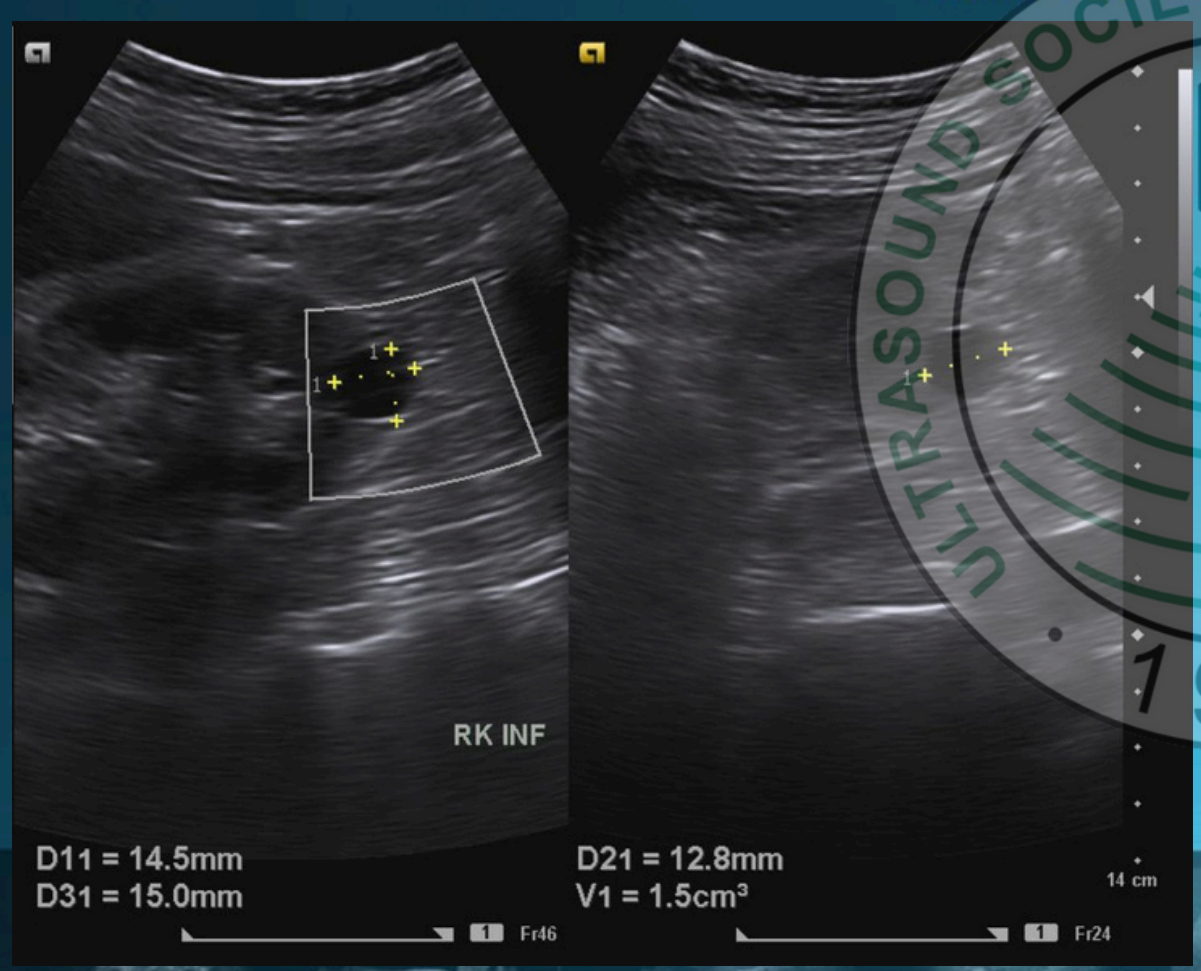

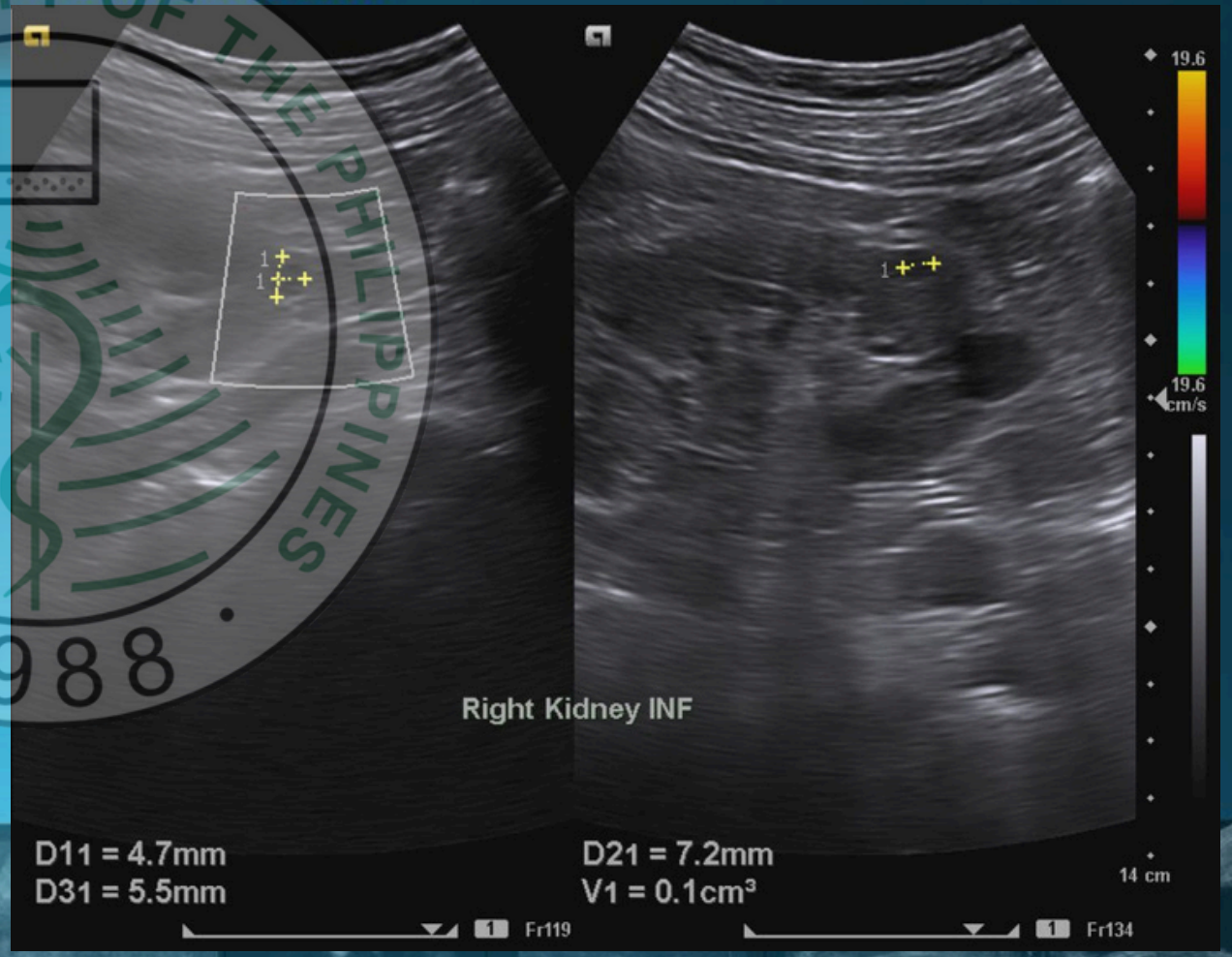

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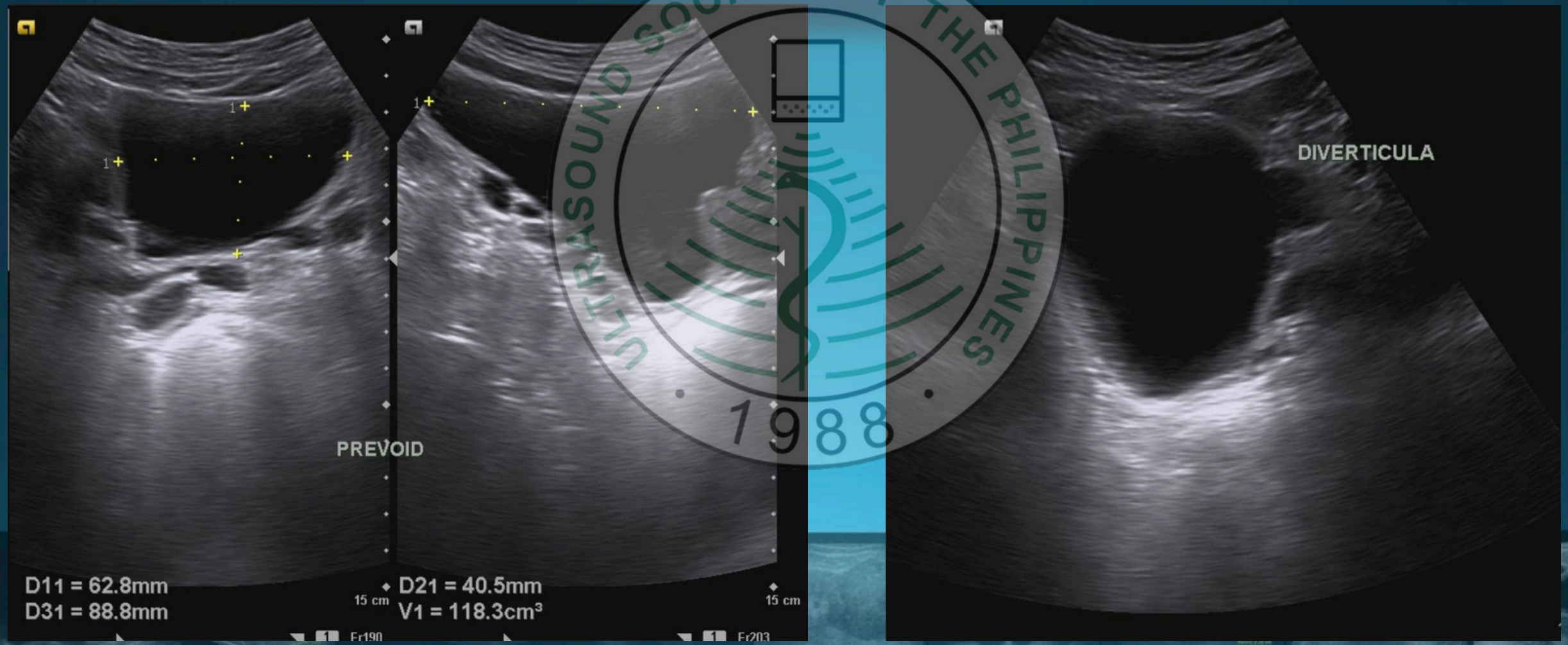
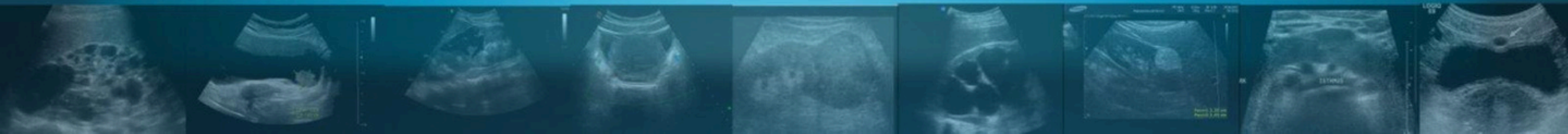


IMPRESSION:

- NORMAL-SIZED KIDNEYS; OVERALL ECHOTEXTURE SUGGESTIVE OF GRADE I MEDICAL RENAL DISEASE
- CORTICAL RENAL CYSTS
- MULTIPLE URINARY BLADDER DIVERTICULA.



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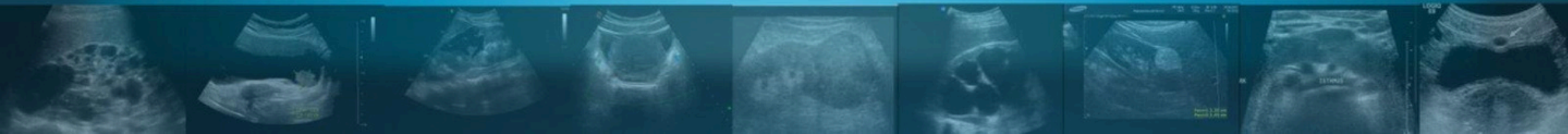
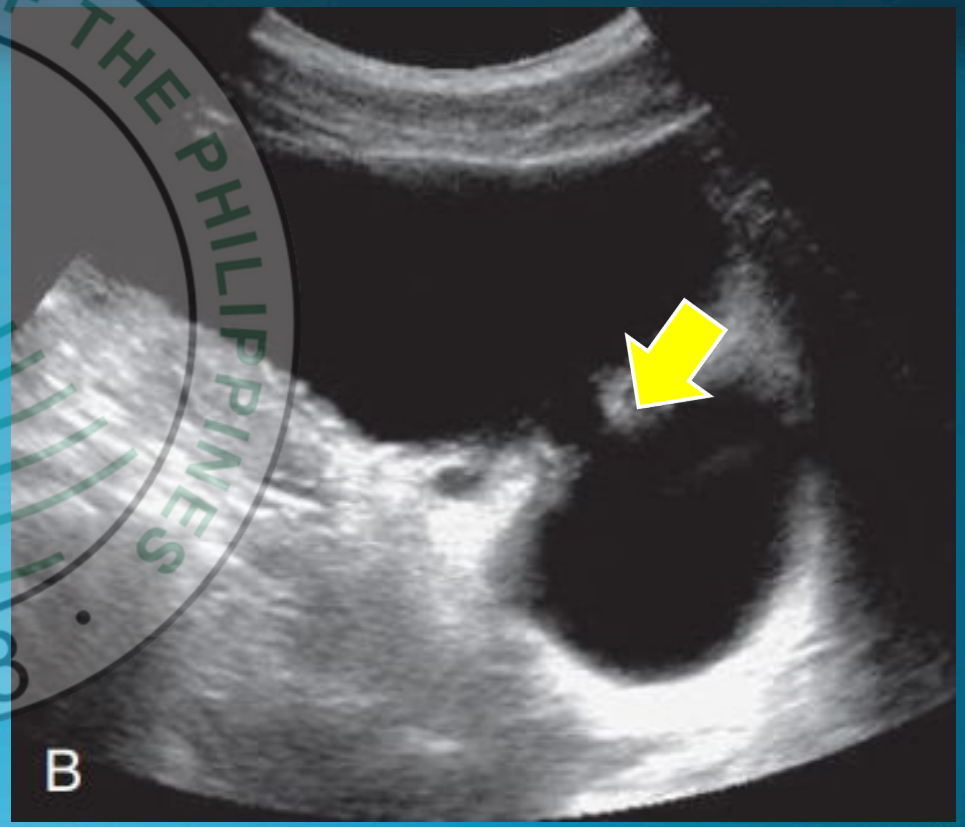
BLADDER DIVERTICULA



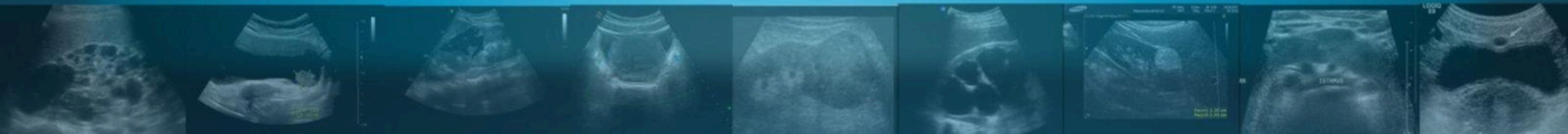
BLADDER DIVERTICULA

- Maybe congenitalor acquired
- Congenital diverticula are known as Hutch diverticula and are located near the ureteral orifice.



FORMATION

- result from bladder outlet obstruction.
- Mucosa herniates through weak areas in the wall (detrusor muscles) that are typically located posterolaterally near the ureteral orifices.



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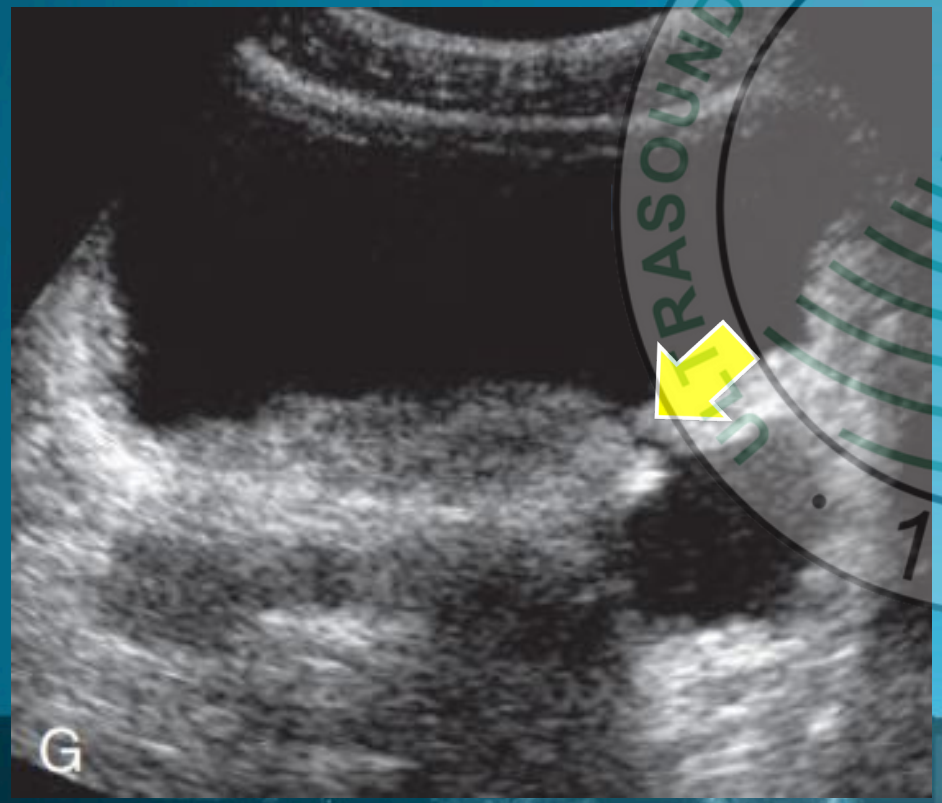
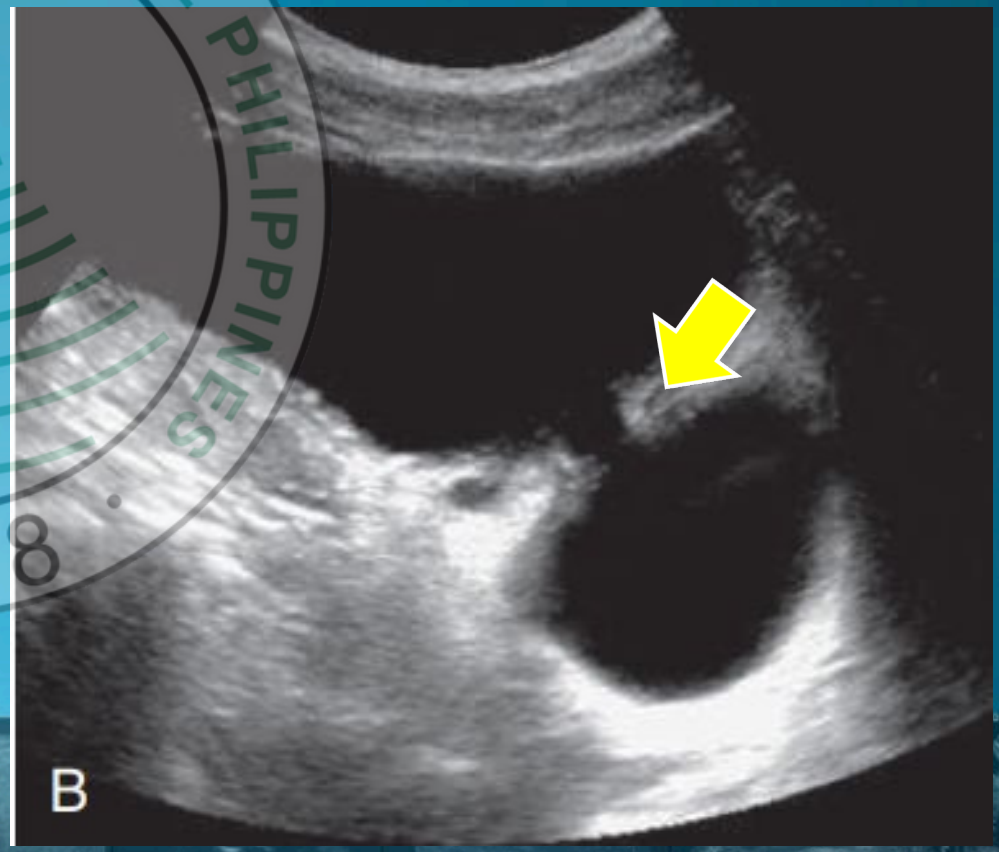
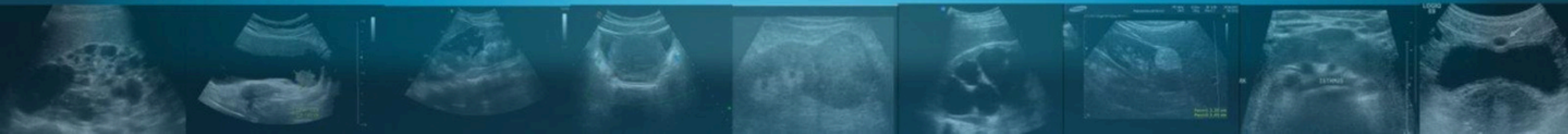
NARROW VERSUS WIDE NECK DIVERTICULA





- Tumors arising in a diverticulum have a poorer prognosis than tumors arising within the bladder.
- Diverticula are composed only of mucosa and submucosa, without the muscularis layer present.
- Tumors therefore grow and invade much more quickly into the surrounding perivesical fat



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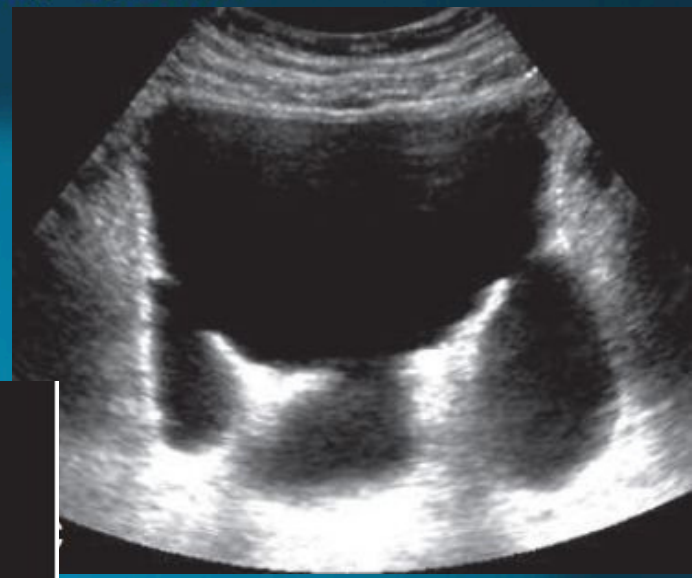
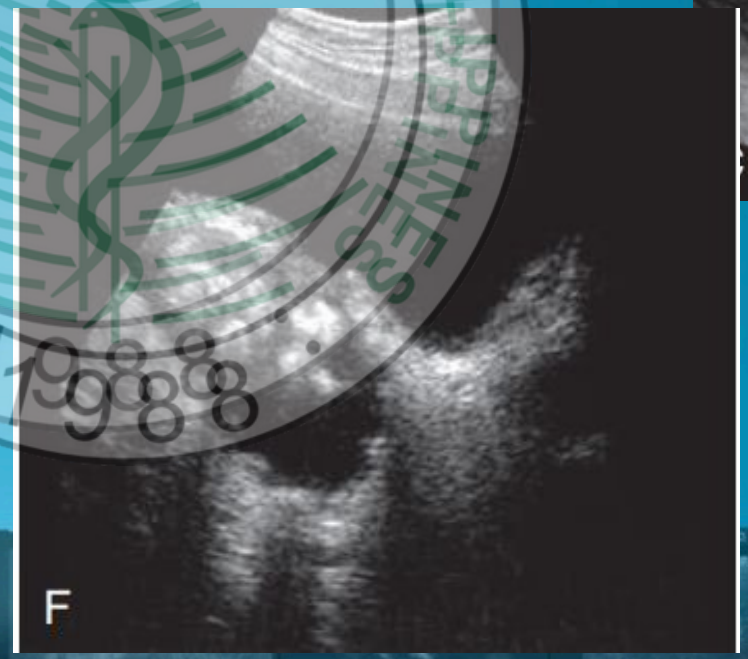
SONOGRAPHIC FINDINGS

- Atsonography, diverticula appear as an outpouching sac from the bladder.
- The internal echogenicity of the diverticulum varies depending on its contents.





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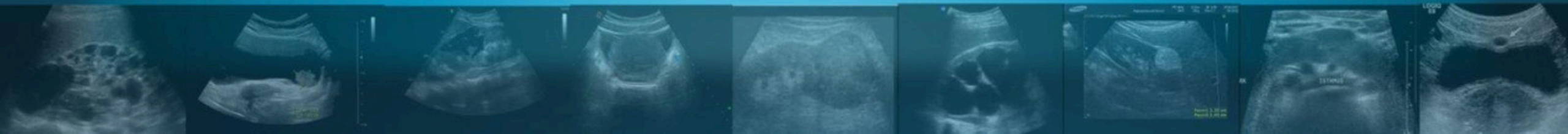
Case # 2



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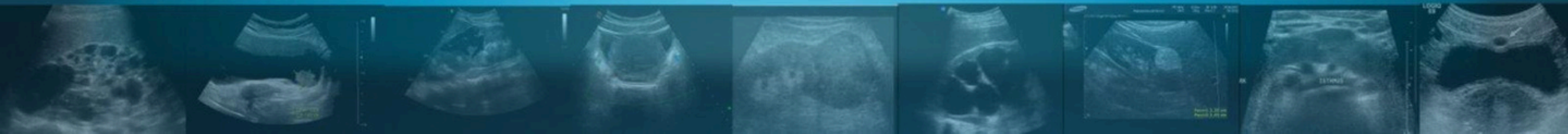
RIGHT FLANK PAIN

38/F



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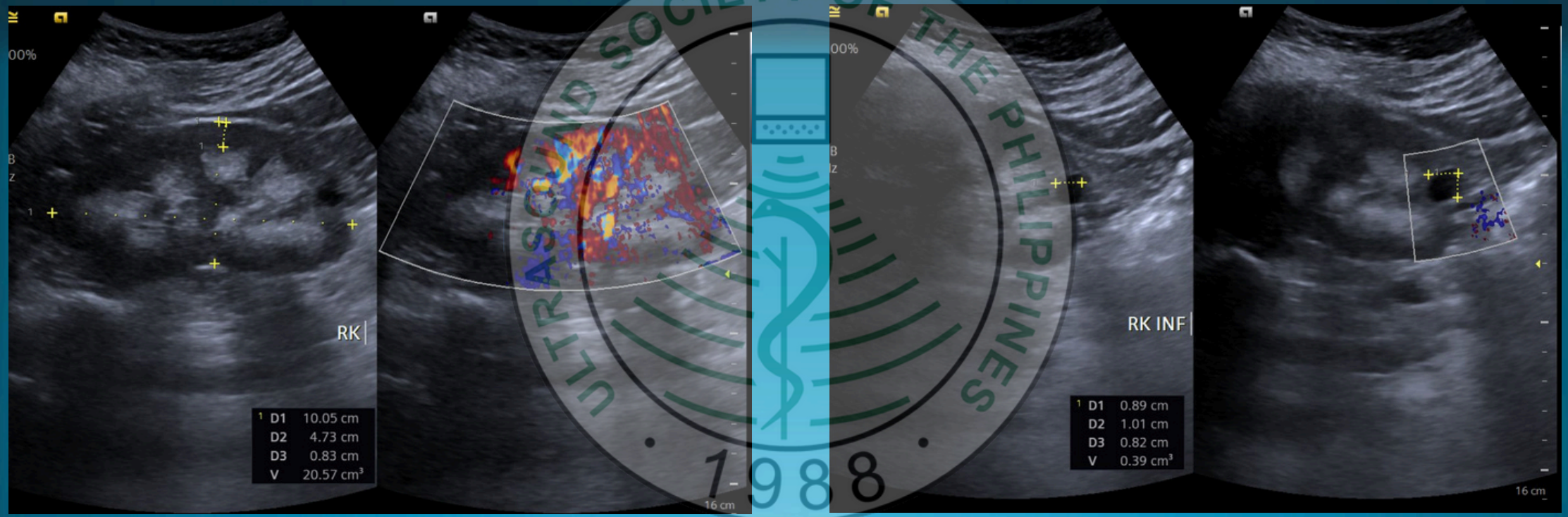

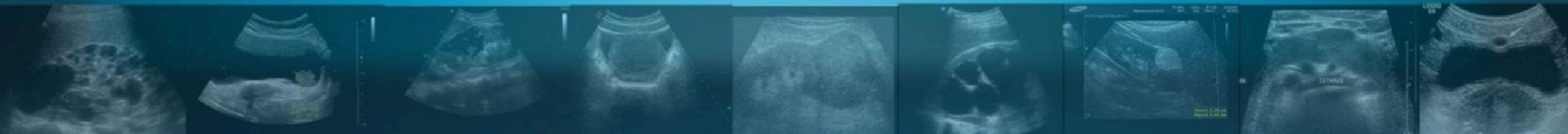

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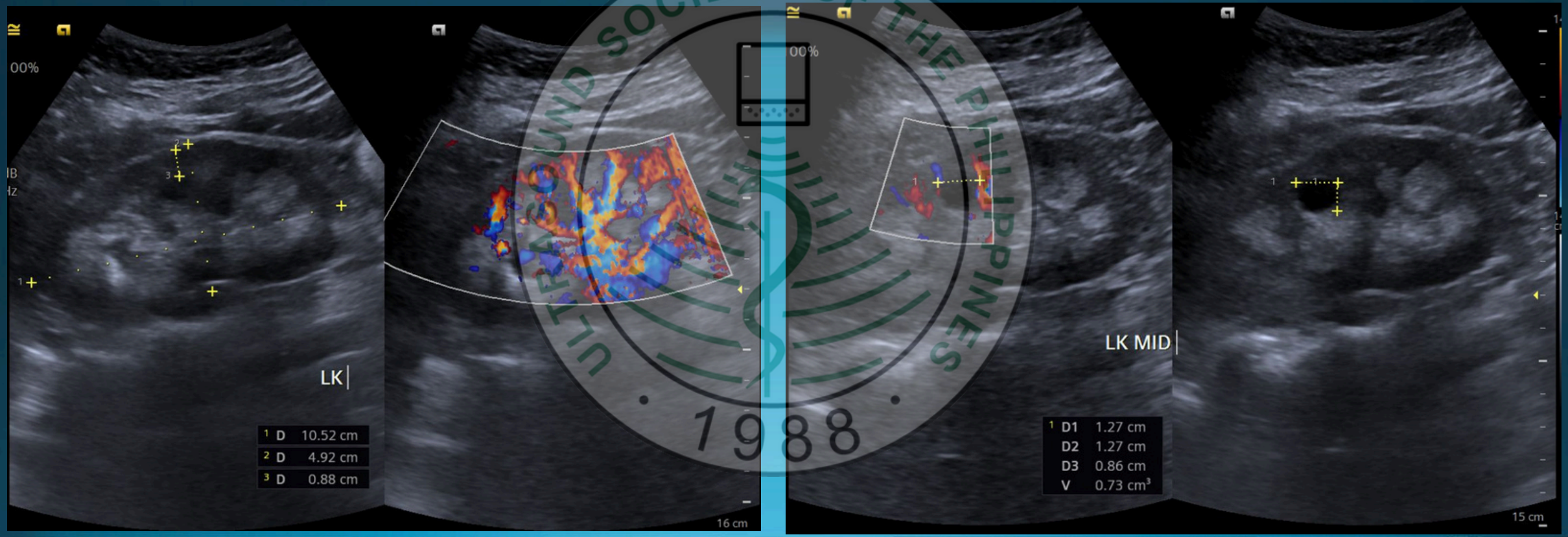

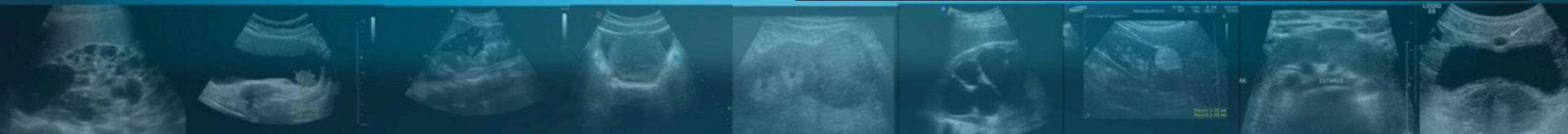

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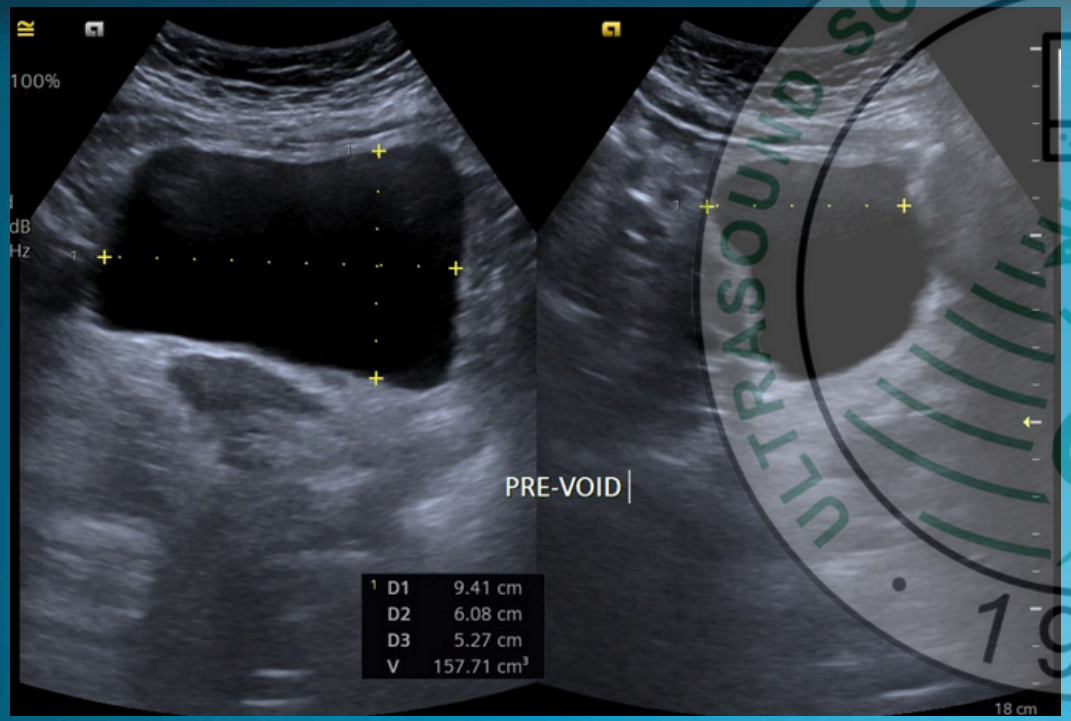
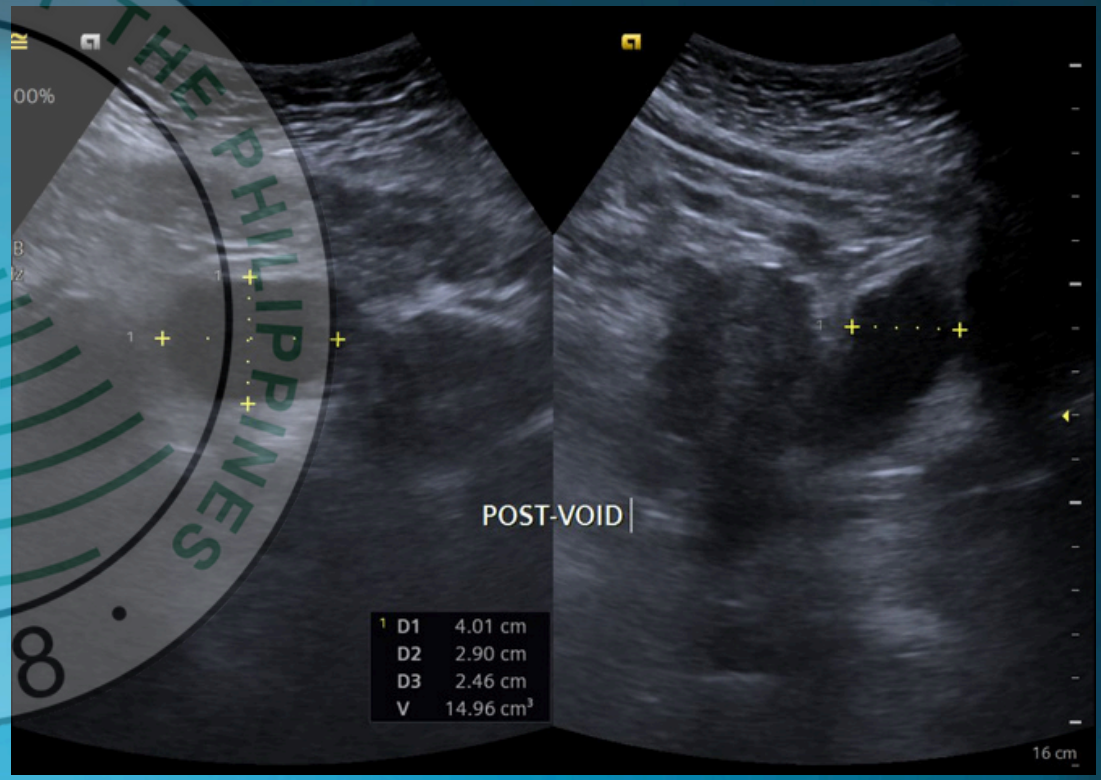
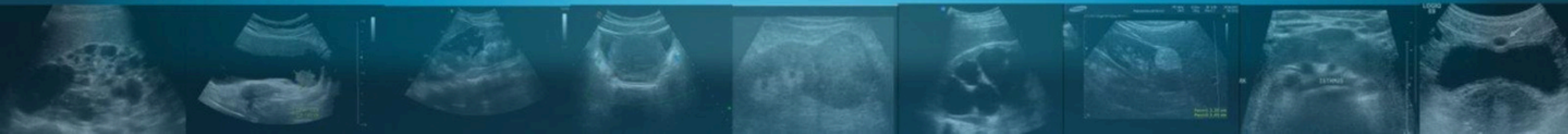
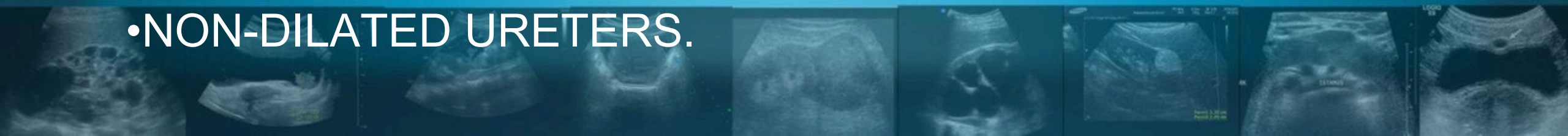






IMPRESSION

- NORMAL-SIZED KIDNEYS WITH BILATERAL MEDULLARY NEPHROCALCINOSIS AND INTERCURRENT CORTICAL CYSTS.
- NORMAL SONOGRAPHIC STUDY OF THE URINARY BLADDER.
- NON-DILATED URETERS.



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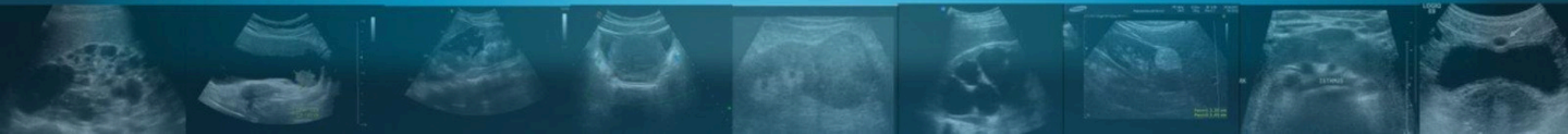
NEPHROCALCINOSIS



NEPHROCALCINOSIS

- RENALPARENCHYMAL CALCIFICATIONS
- DYSTROPHIC VERSUS METASTATIC

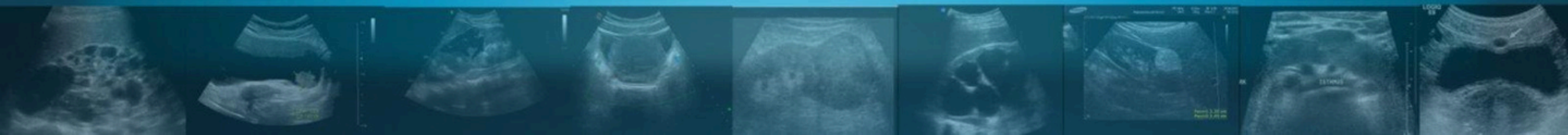
NEPHROCALCINOSIS

DYSTROPHIC NEPHROCALCINOSIS

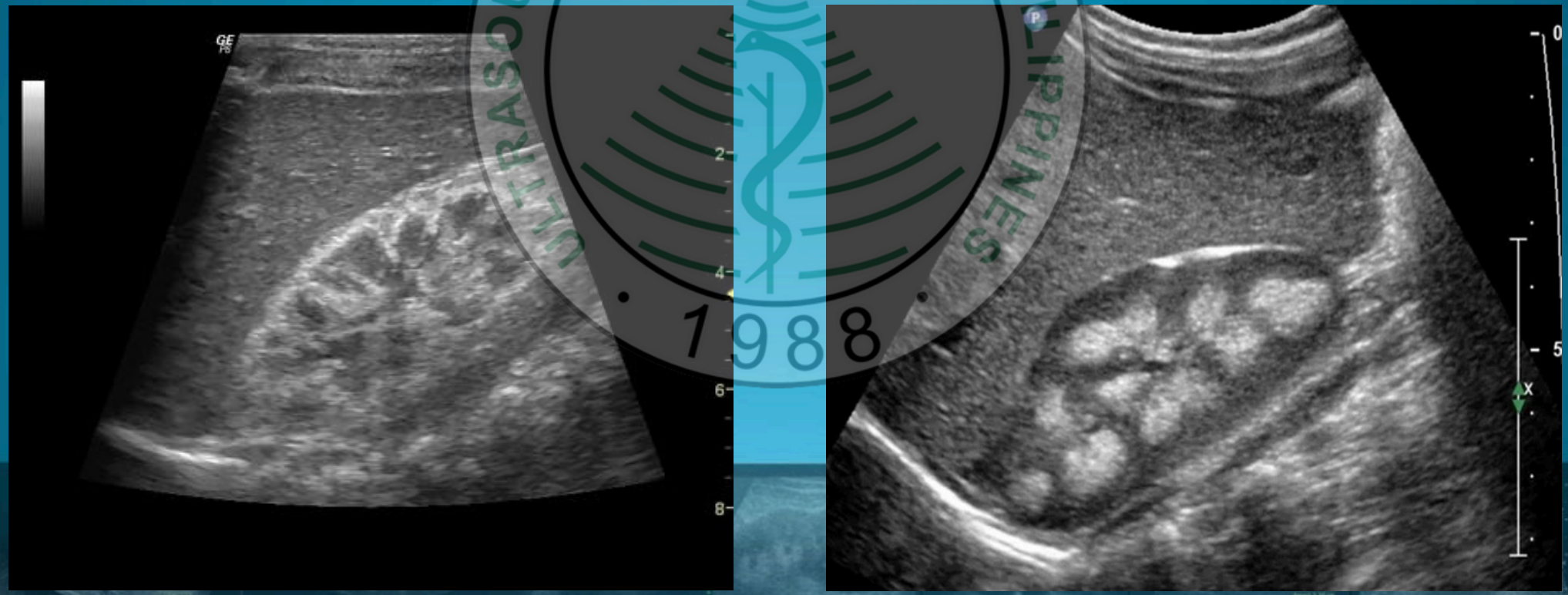
- DEVITALIZED (ISCHEMIC OR NECROTIC) TISSUE
- TUMOR, ABSCESSES AND HEMATOMAS

METASTATIC NEPHROCALCINOSIS

- HYPERCALCEMIC STATES
- HYPERPARATHYROIDISM, RENAL TUBULAR ACIDOSIS AND RENAL FAILURE



Metastatic nephrocalcinosis



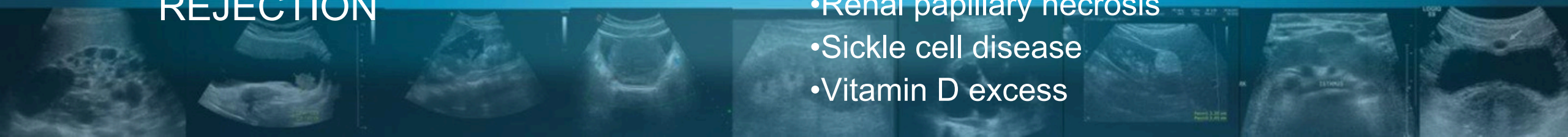
METASTATIC NEPHROCALCINOSIS

CORTICAL METASTATIC

- ACUTE CORTICAL NEPHROSIS
- CHRONIC GLOMERULONEPHRITIS
- CHRONIC HYPERCALCEMIC STATES
- ETHYLENE GLYCOL POISONING
- SICKLE CELL DISEASE
- RENAL TRANSPLANT REJECTION

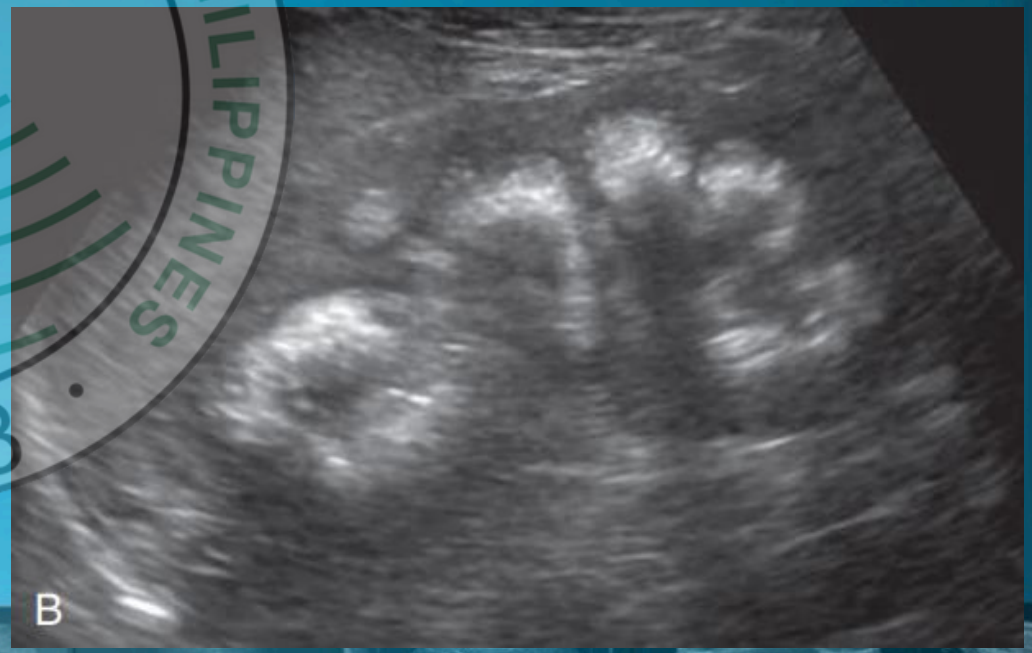
MEDULLARYMETASTATIC

- HYPERPARATHYROIDISM (40%)
- RENAL TUBULAR ACIDOSIS (20%)
- Medullary sponge kidney
- Bone metastases
- Chronic pyelonephritis
- Cushing syndrome
- Hyperthyroidism
- Malignancy
- Renal papillary necrosis
- Sickle cell disease
- Vitamin D excess



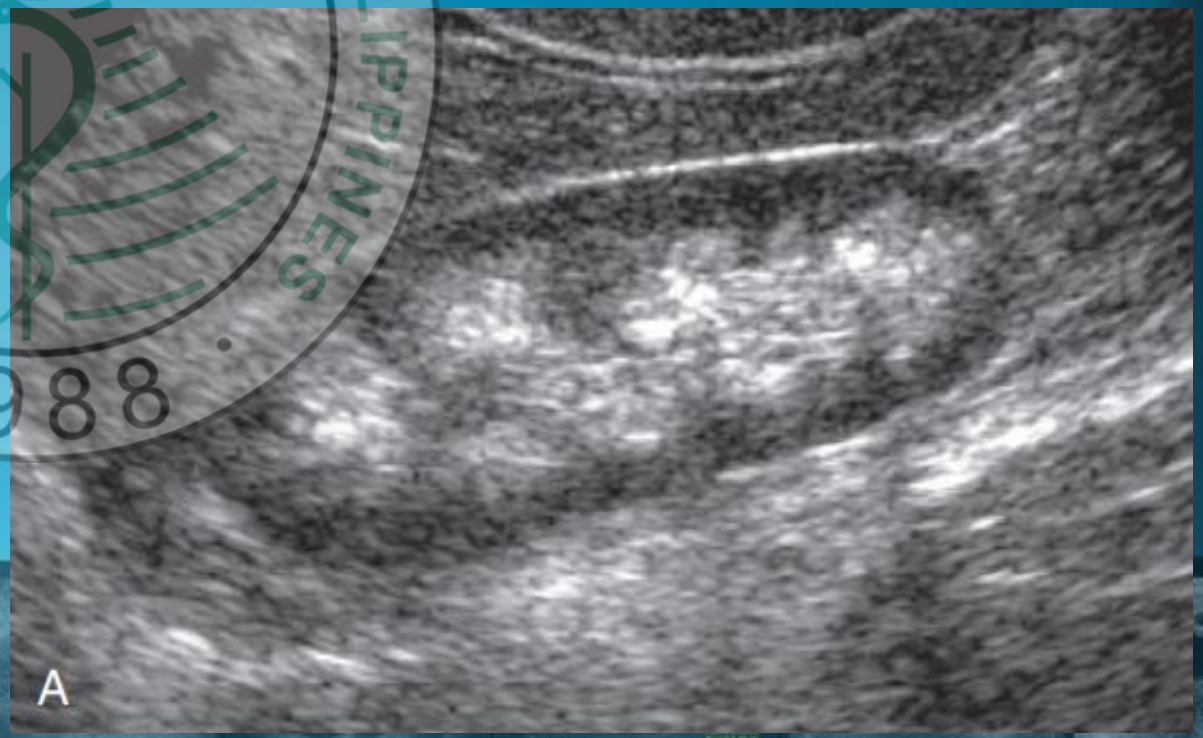
Anderson-carr-randall theory

- Concentration of calcium is high in the fluid around the renal tubules → calcium is removed by the lymphatics
- **Amount of calcium > lymphatic capacity** = deposits of calcium in the fornical tips and margin of the medulla will result



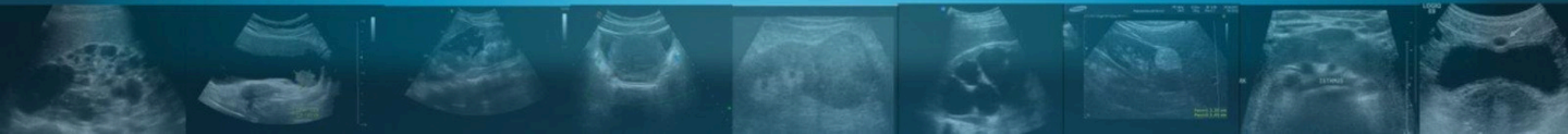
ULTRASOUND FINDINGS

- Non-shadowing echogenic rims surrounding the medullary pyramids (early ultrasound findings)
- ↑ calcium deposit → acoustic shadowing
- *** calcium may perforate the calix and form a nidus for further stone growth



Similar entities

- Medullary sponge kidney – also manifest as increased medullary echogenicity
- Normal transient findings in neonates



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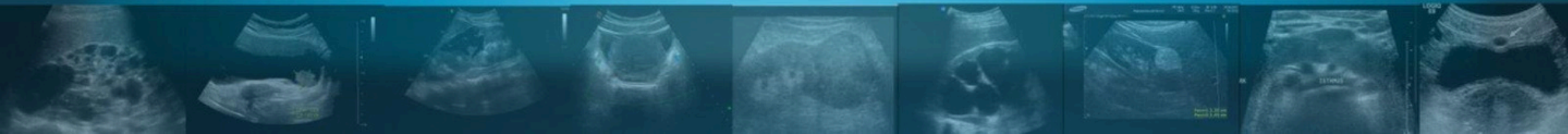
Case #3



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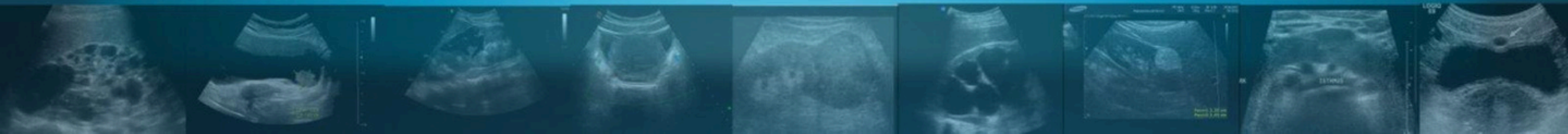
ASYMPTOMATIC PATIENT/FOR CHECK-UP

42/F



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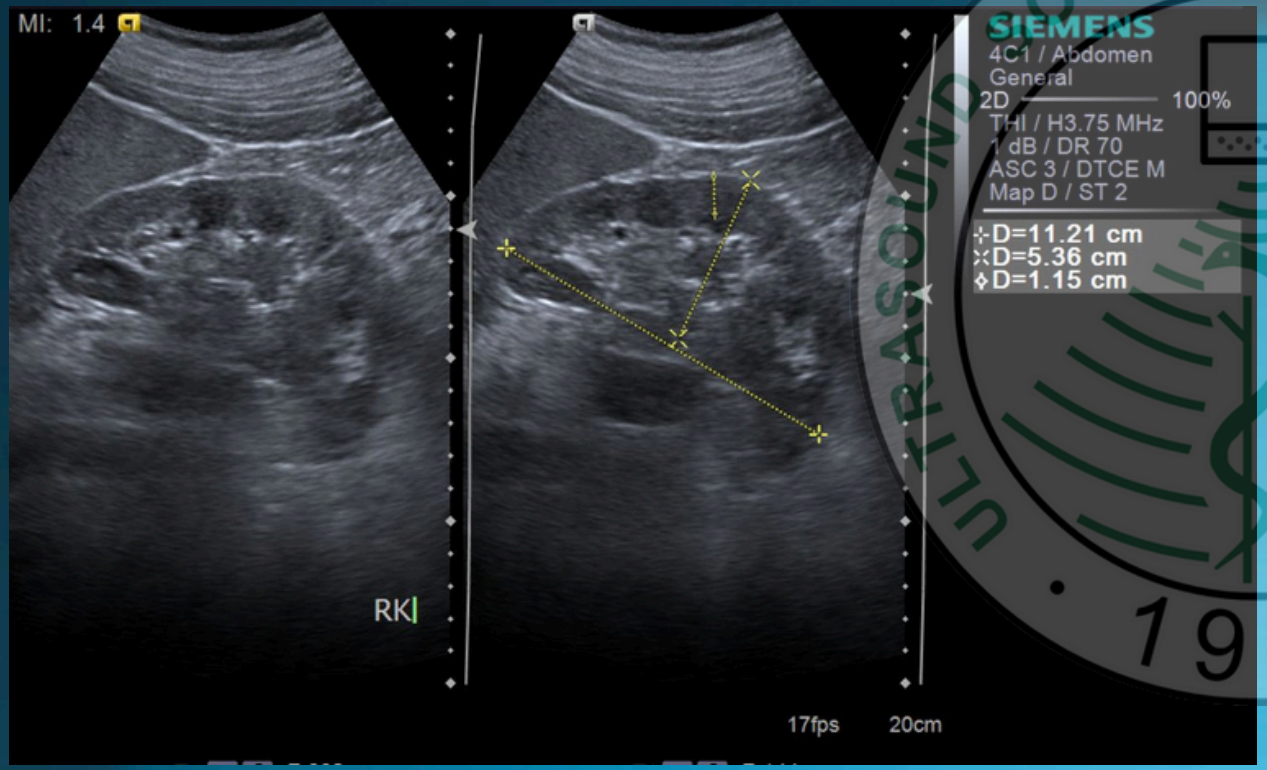

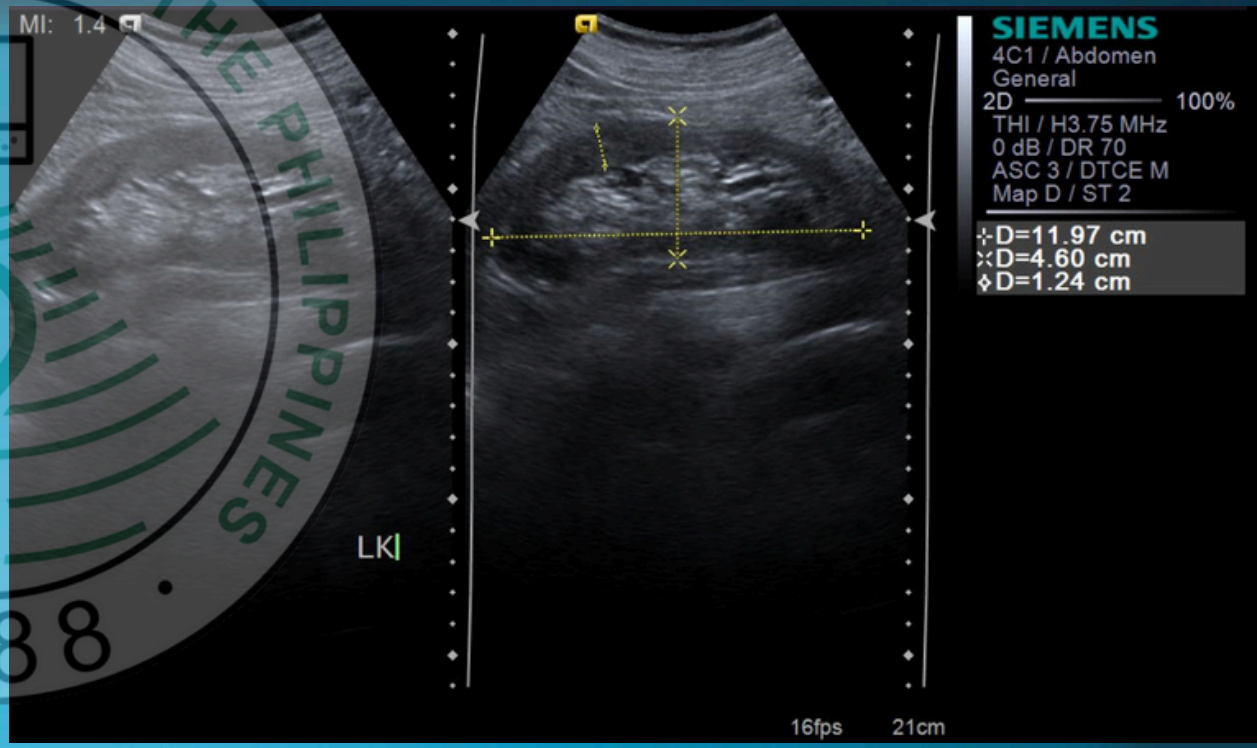

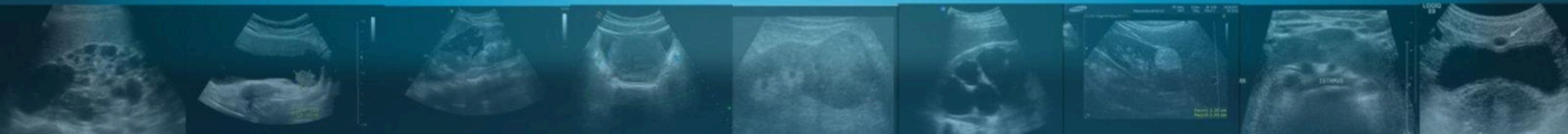

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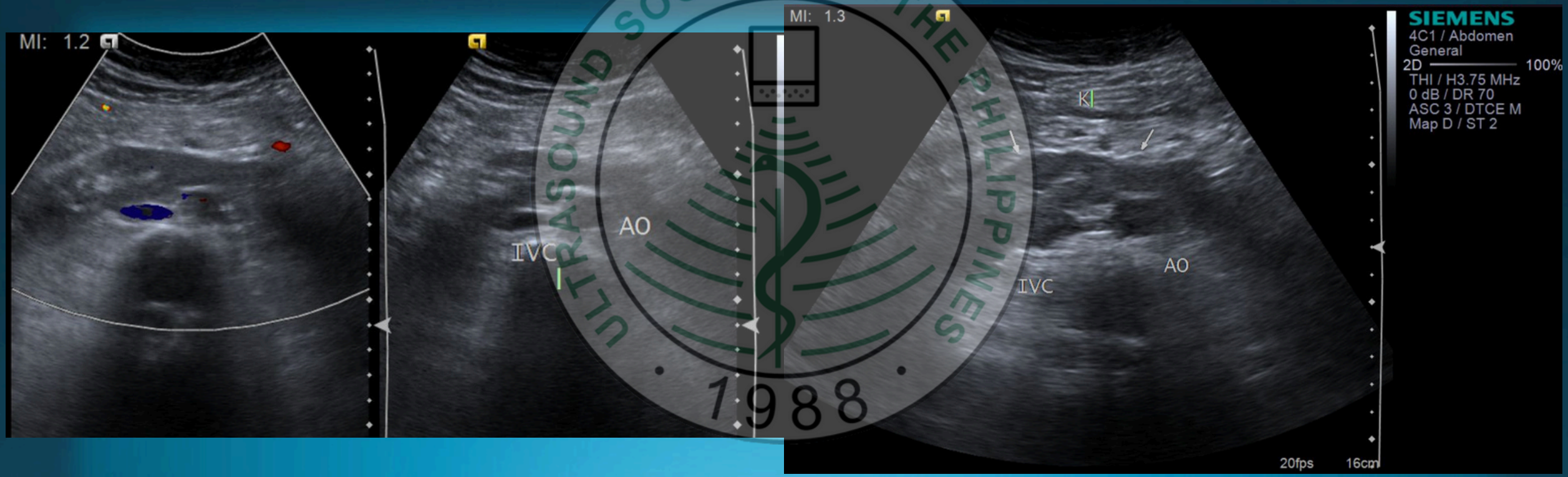

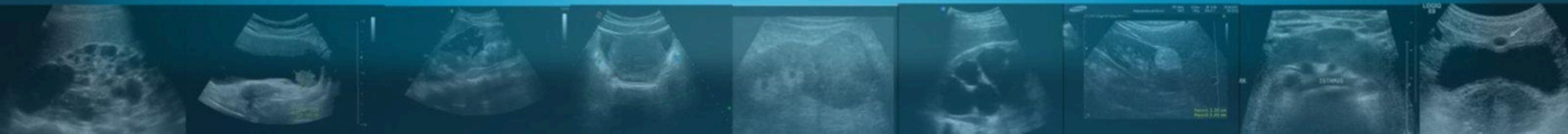

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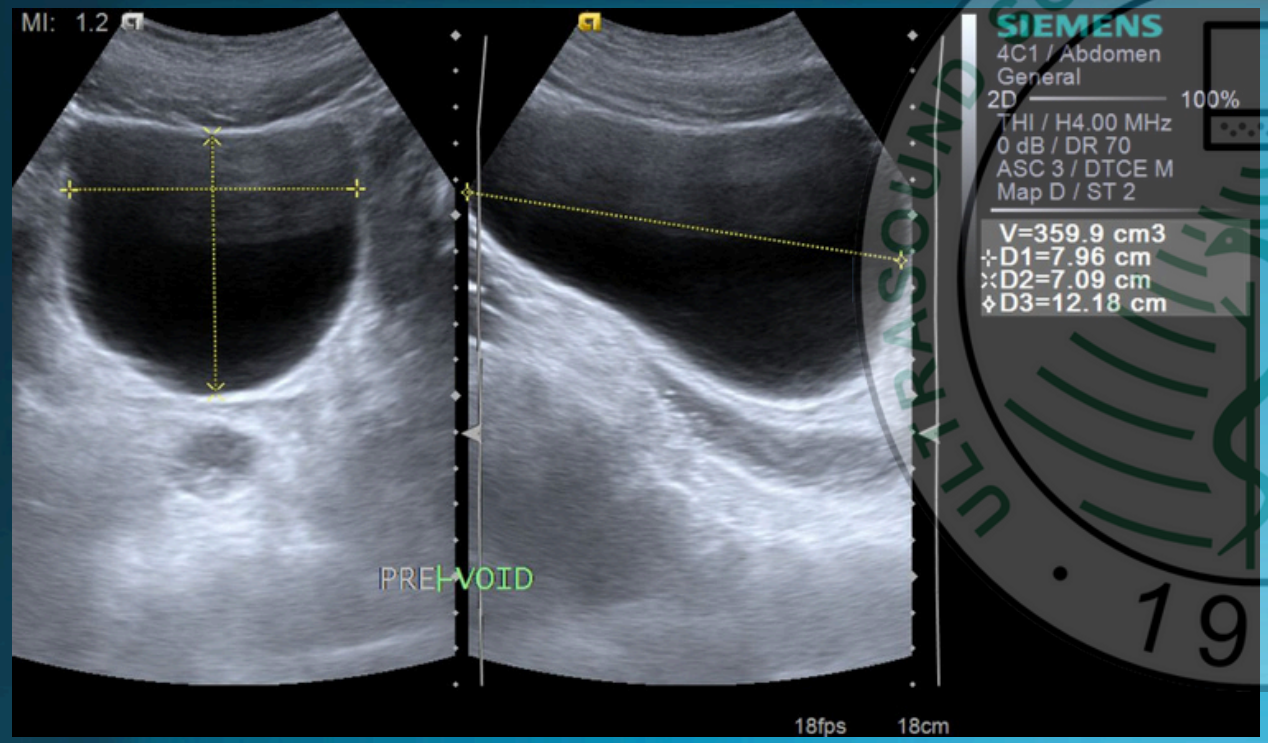

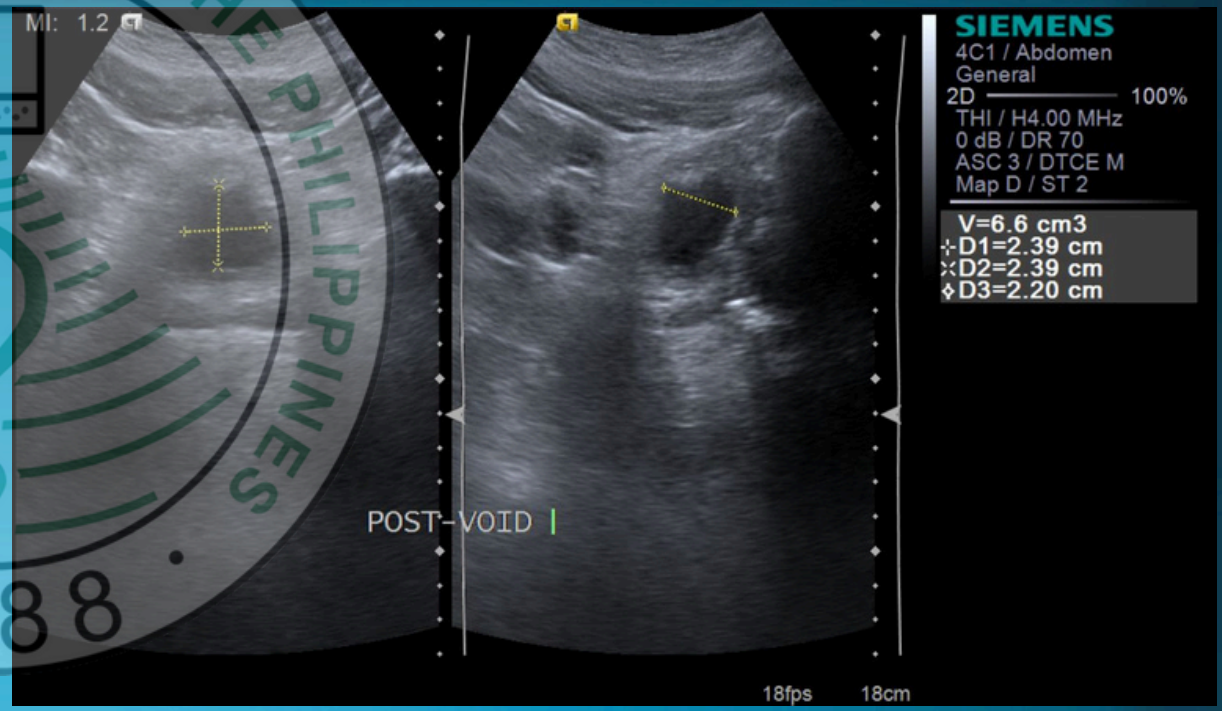

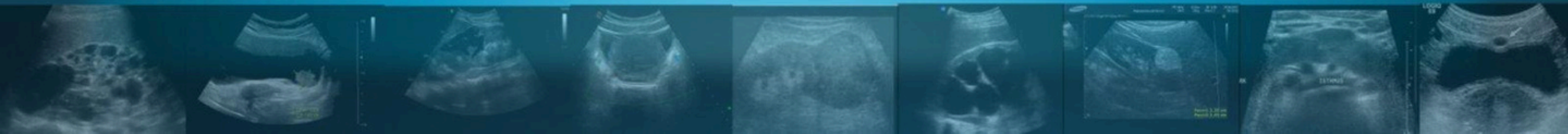

Essentials and Updates on Ultrasonography of the Genitourinary System
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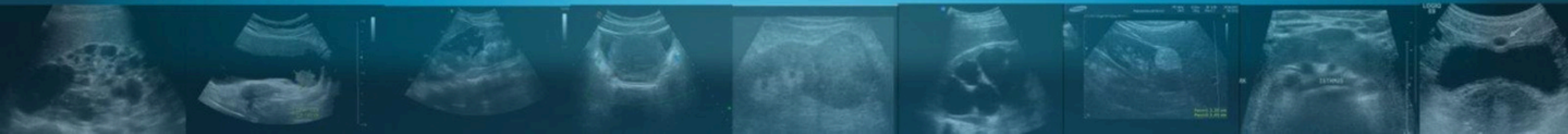
IMPRESSION

- MEDIALLYORIENTED NORMAL-SIZED KIDNEYS WITH HORSESHOE CONFIGURATION
- SONOGRAPHICALLY NORMAL URINARY BLADDER



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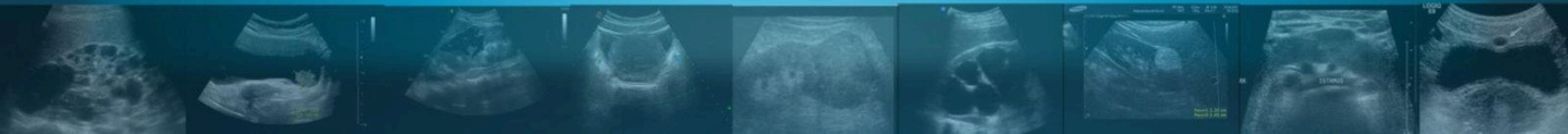
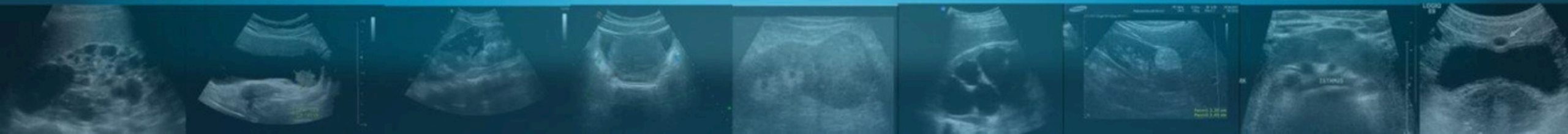
HORSESHOE KIDNEY



HORSESHOE KIDNEY

- Incidence: 0.01% and 0.25%
- occur when metanephrogenic blastema fuse prior to ascent
- fusion is usually at the lower poles (95%).
- Ascent is inhibited by the inferior mesenteric artery



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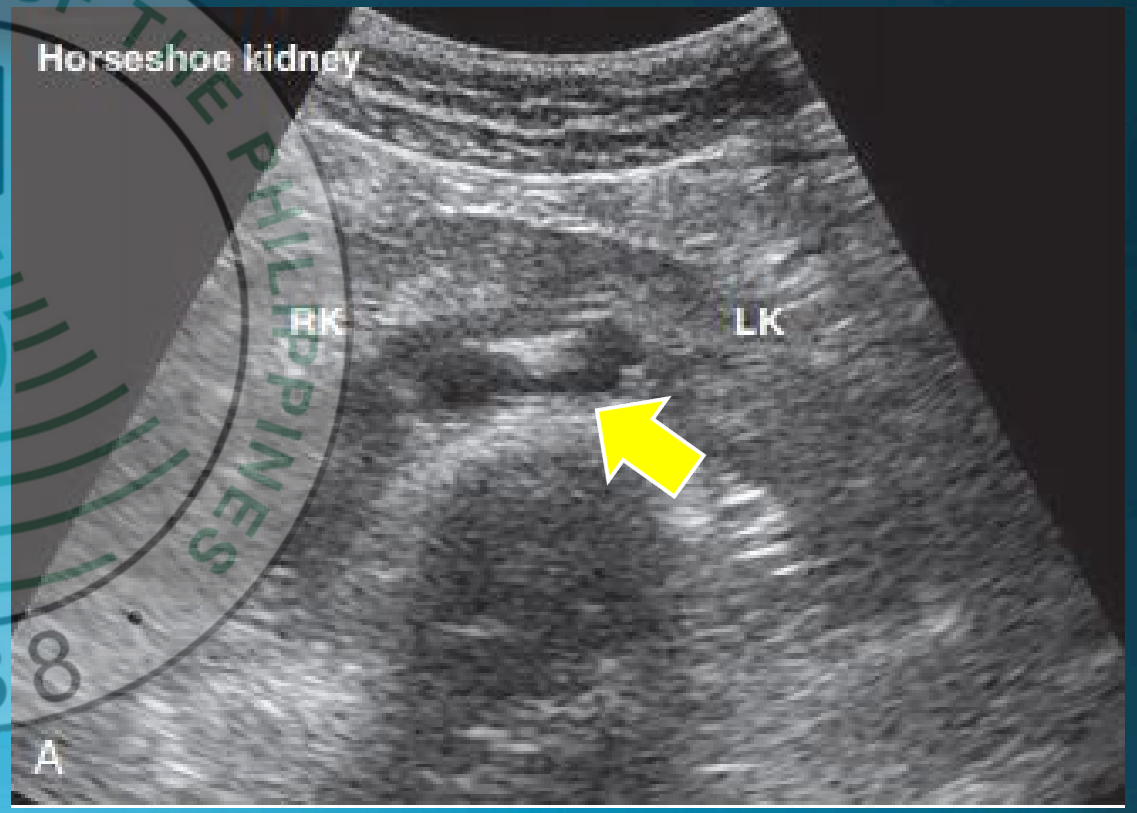
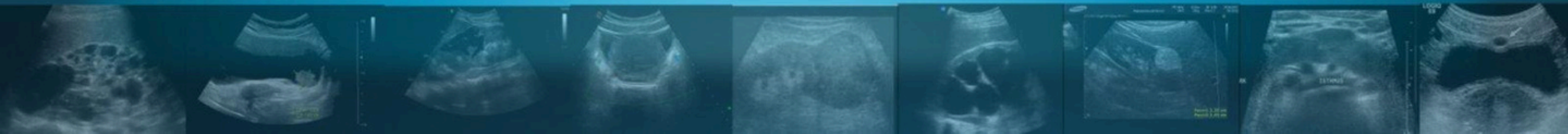
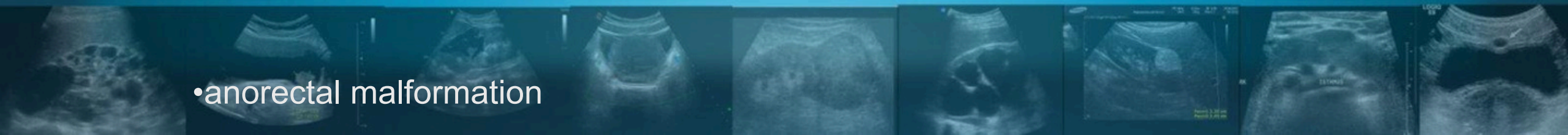
- isthmus is composed of functioning renal tissue although rarely it is made up of fibrous tissue.





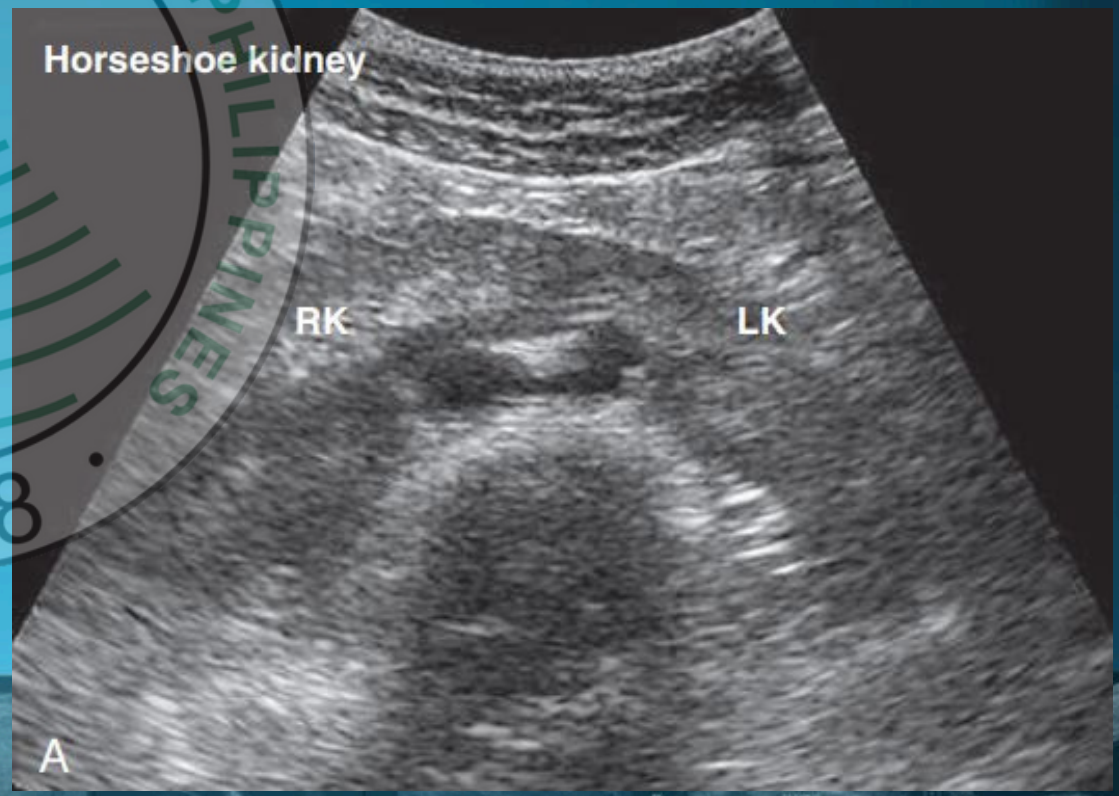
- Abnormal rotation → UPJ obstruction → predisposed to infection and stone formation.
- Additional associated anomalies:
  - vesicoureteral reflux
  - collecting system duplication
  - renal dysplasia
  - Retrocaval ureter
  - supernumerary kidney



- anorectal malformation

SONOGRAPHIC FINDINGS

- usually lower than normal and thelower polesproject medially.
- Transverse imaging → renal isthmus crossing the midline anterior to abdominal great vessels.
- Hydronephrosis (pyelocaliectasis) and collecting system calculi may be evident.



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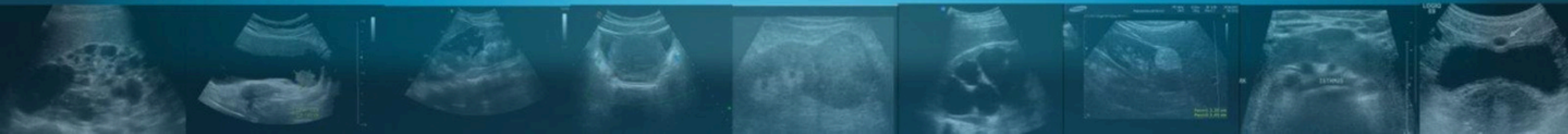
Case #4



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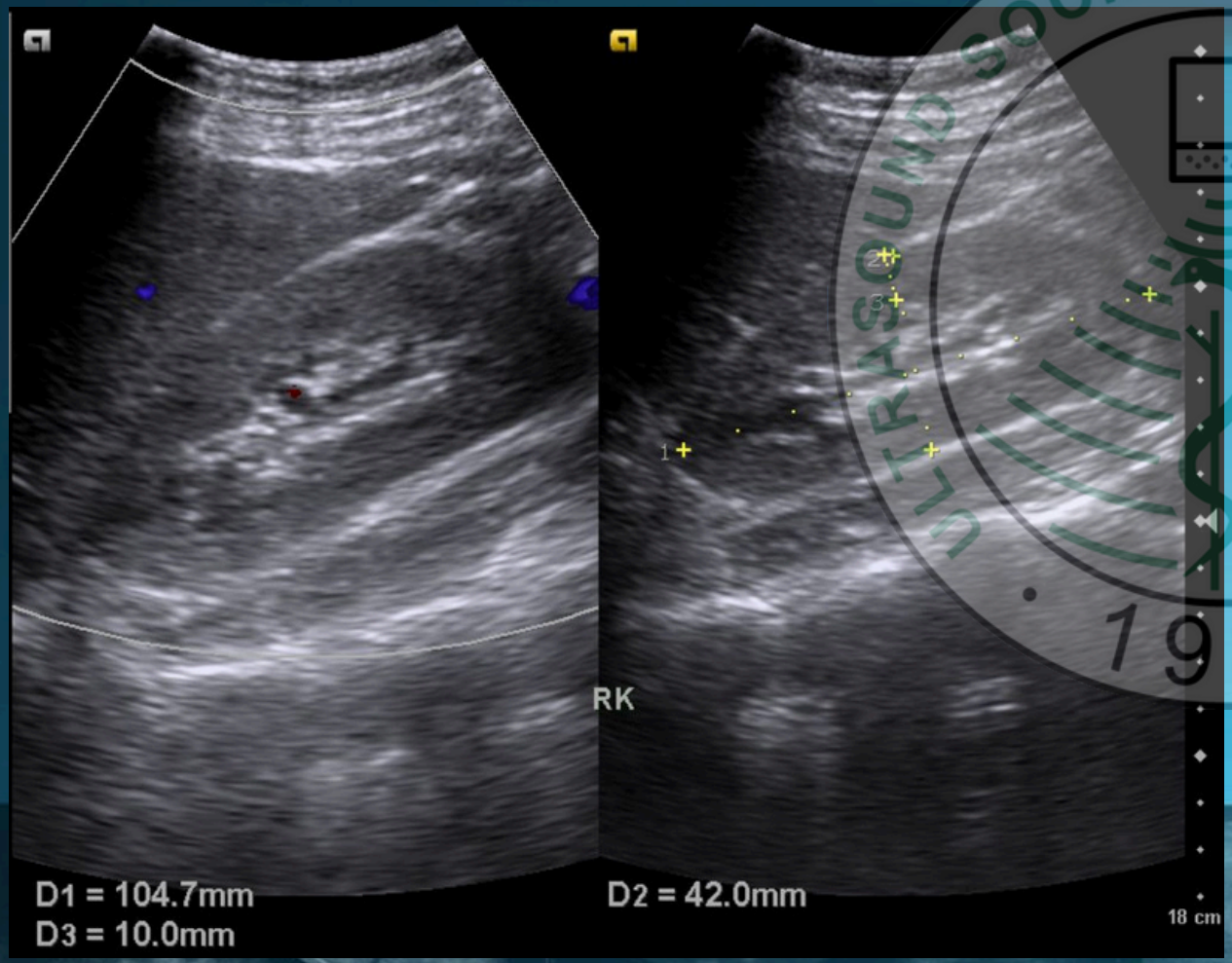

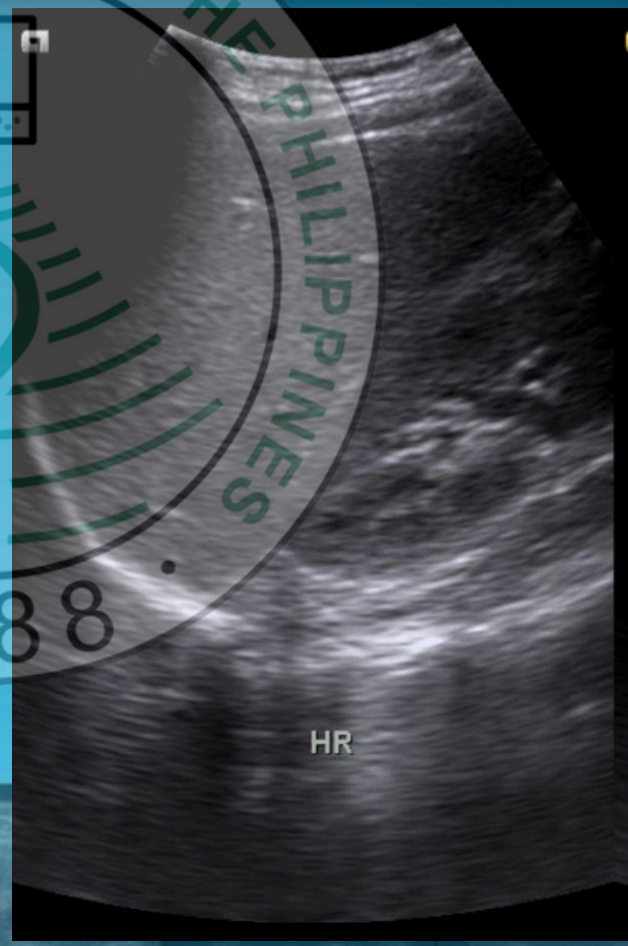

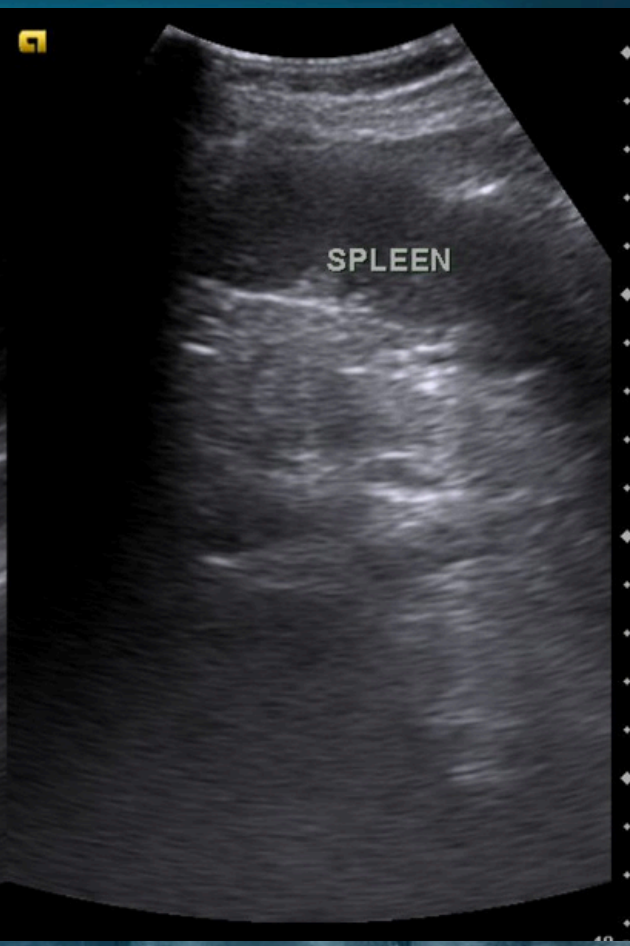

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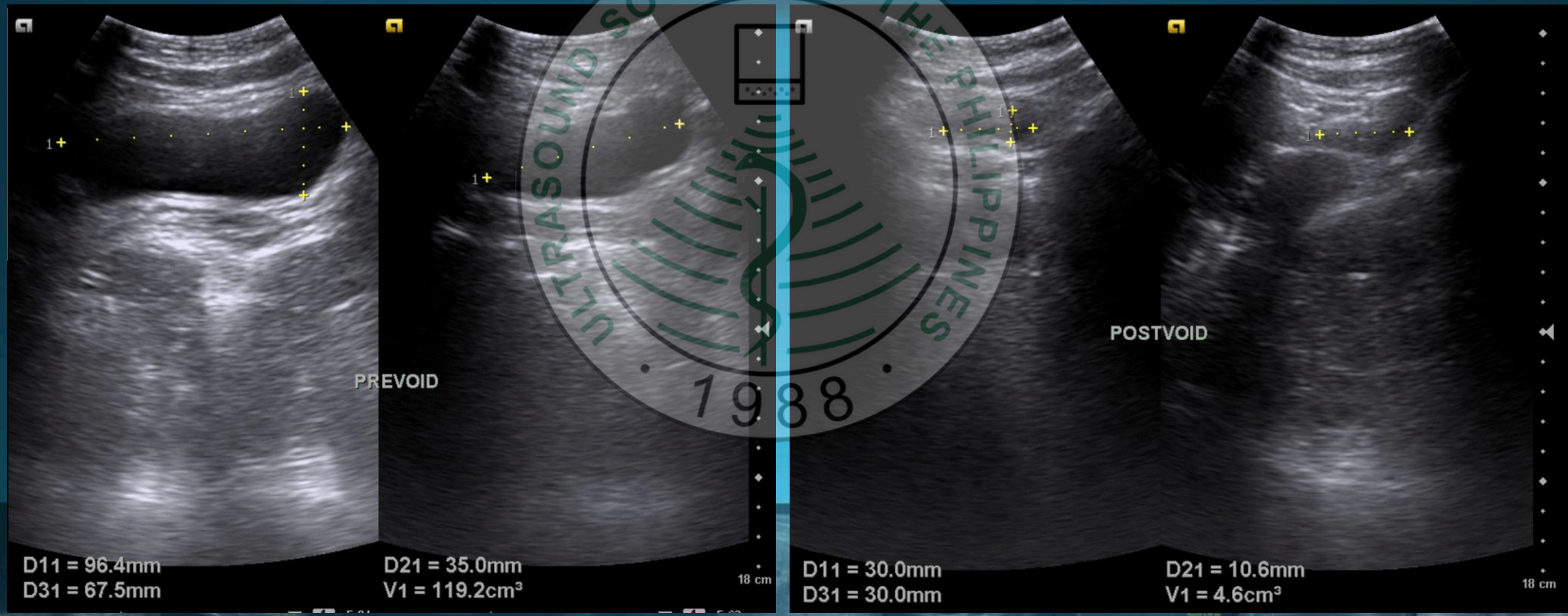
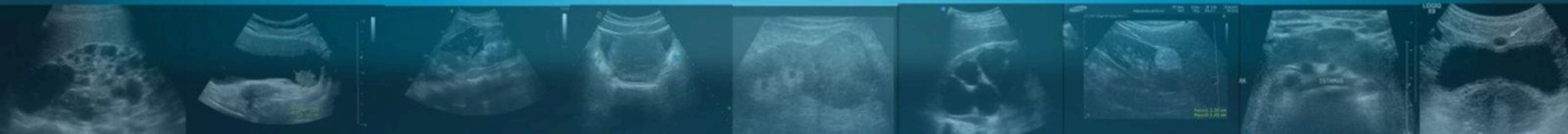


IMPRESSION:

- NORMAL SONOGRAPHIC STUDY OF THE RIGHT KIDNEY AND URINARY BLADDER.
- NON-DILATED RIGHT URETER.
- KNOWN RENAL AGENESIS, LEFT.



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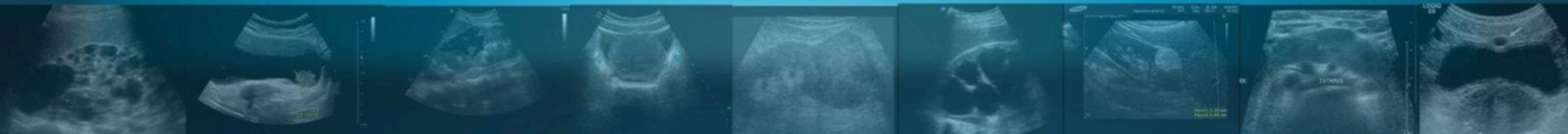
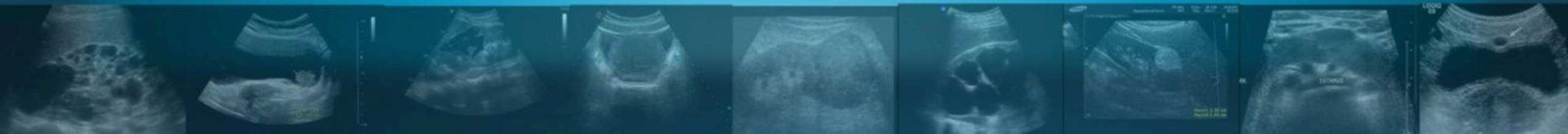
RENAL AGENESIS



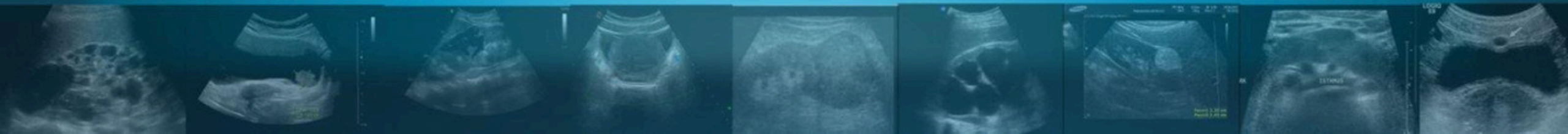
RENAL AGENESIS

- Renalagenesismaybe unilateral or bilateral.
- Bilateral renal agenesis is a rare anomaly that is incompatible with life.
- The prevalence rate of bilateral agenesis at autopsies is 0.04%. The condition has a 3 :1 male predominance.



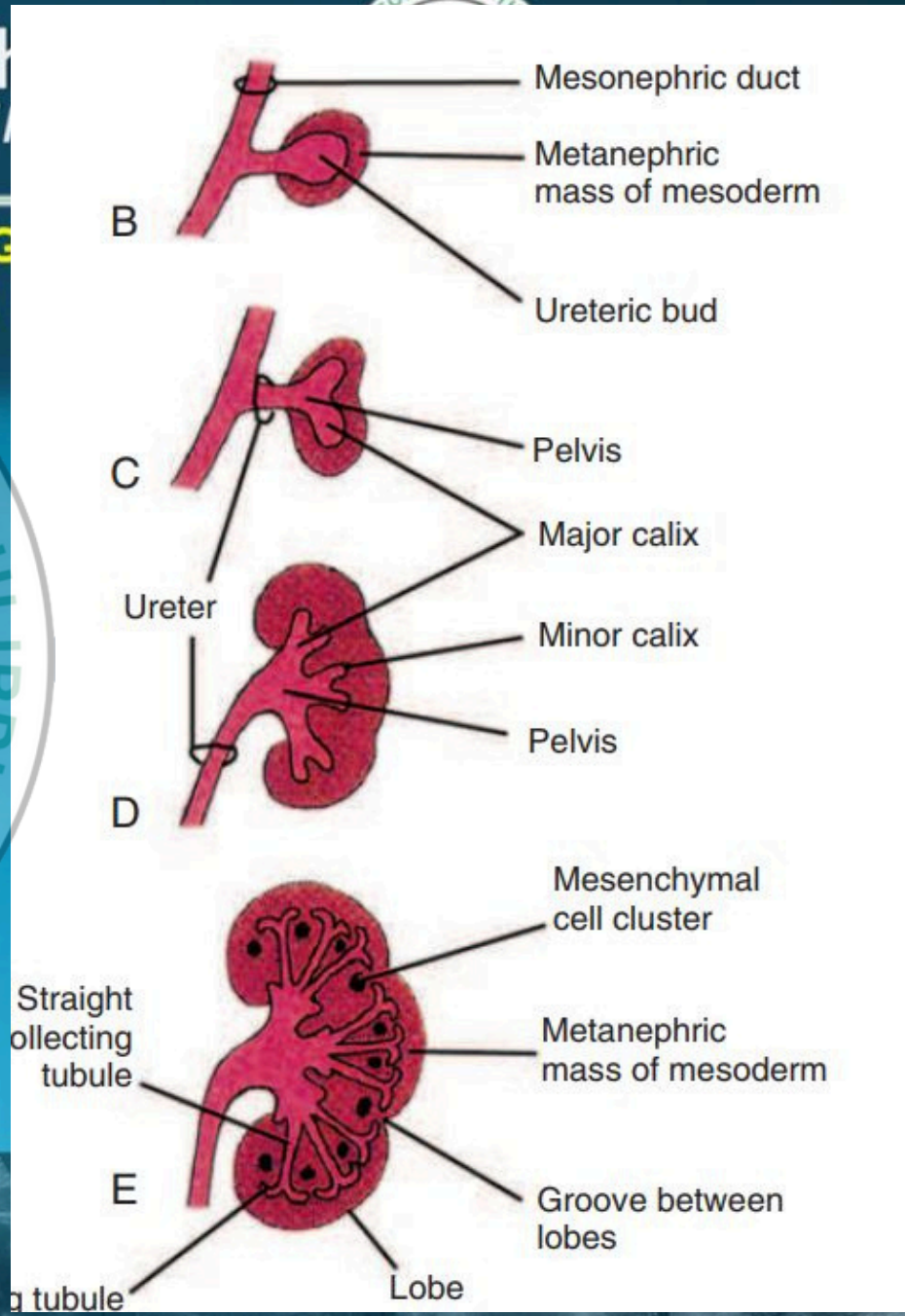
UNILATERAL RENAL AGENESIS

- usually an incidental finding; the contralateral kidney of these patients may be quite large secondary to compensatory hypertrophy.



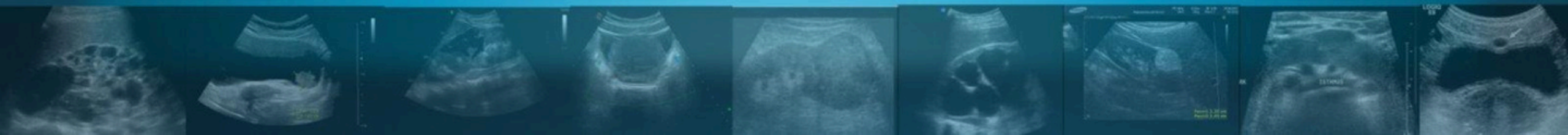
UNILATERAL RENAL AGENESI

- occurswhen there is
- (1) absence of the metanephrogenic blastema
- (2) absence of ureteral bud development, or
- (3) absence of interaction and penetration of the ureteral bud with the metanephrogenic blastema.



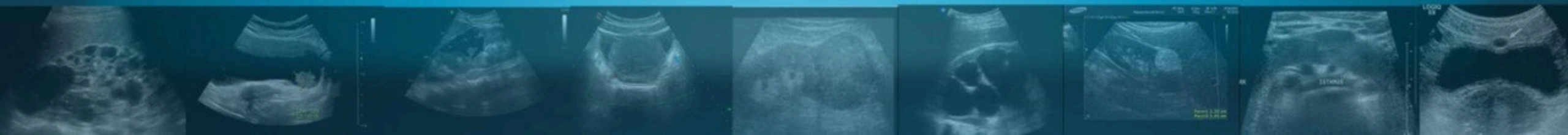
OTHER ASSOCIATED DISEASE

- genital tract anomalies, which are often cystic pelvic masses in both men and women.
- Other associated anomalies include skeletal abnormalities, anorectal malformations, and cryptorchidism.



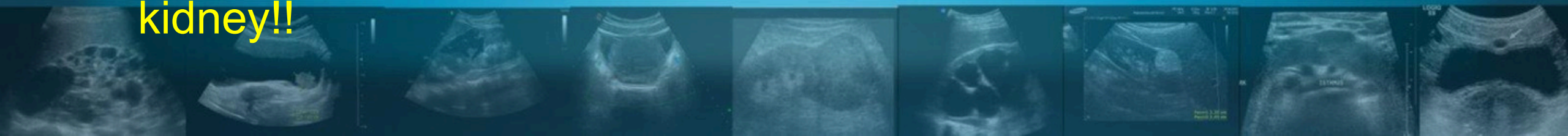
SONOGRAPHIC FINDINGS

- At ultrasound, although the kidney is absent, a normal adrenal gland is usually found. The adrenal gland will be absent in 8% to 17% of patients with renal agenesis.



Note

- Itmay be difficult to differentiate between renal agenesis and a small, hypoplastic or dysplastic kidney.
- With all these conditions, the contralateral kidney will be enlarged as a result of compensatory hypertrophy.
- Usually, the colon falls into the empty renal bed.
- Care should be taken not to confuse a loop of gut with a normal kidney!!



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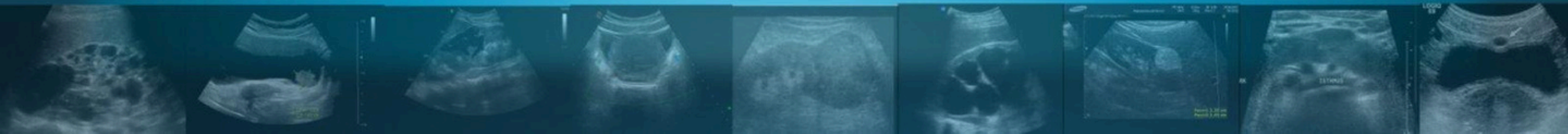
Case #5



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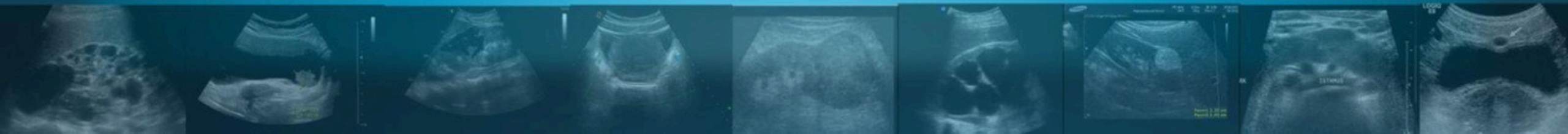
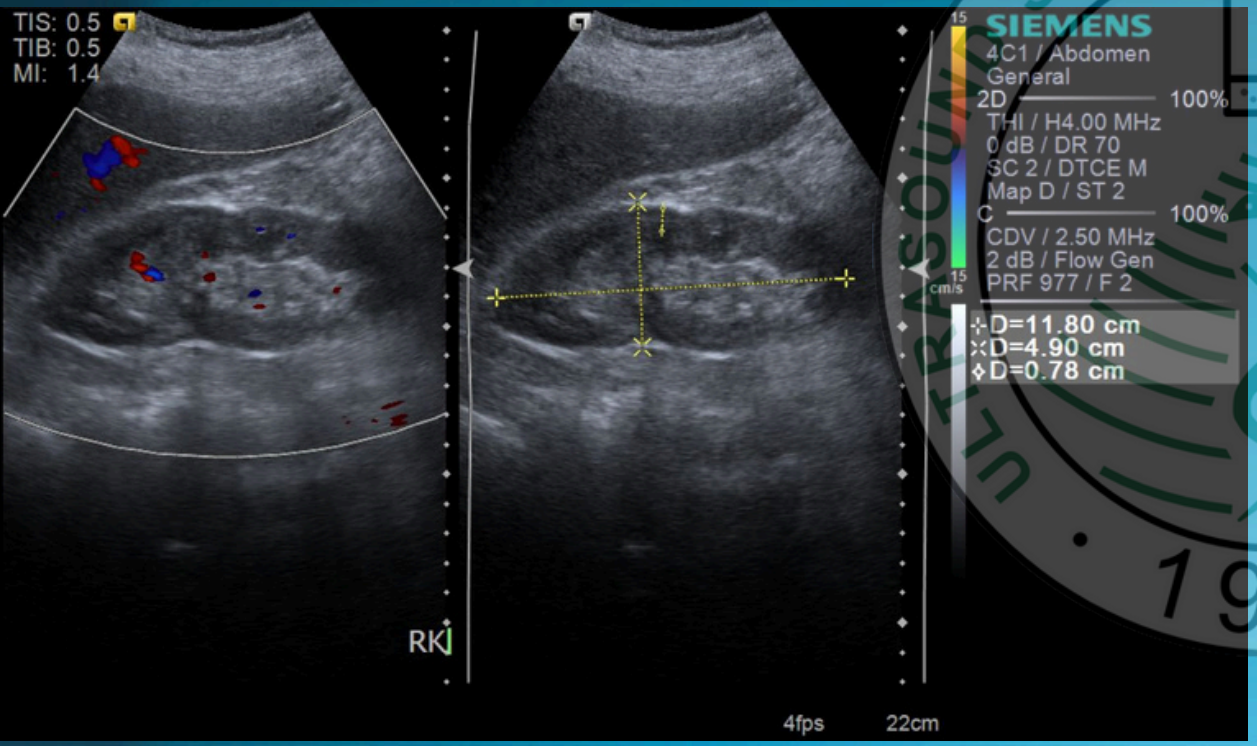
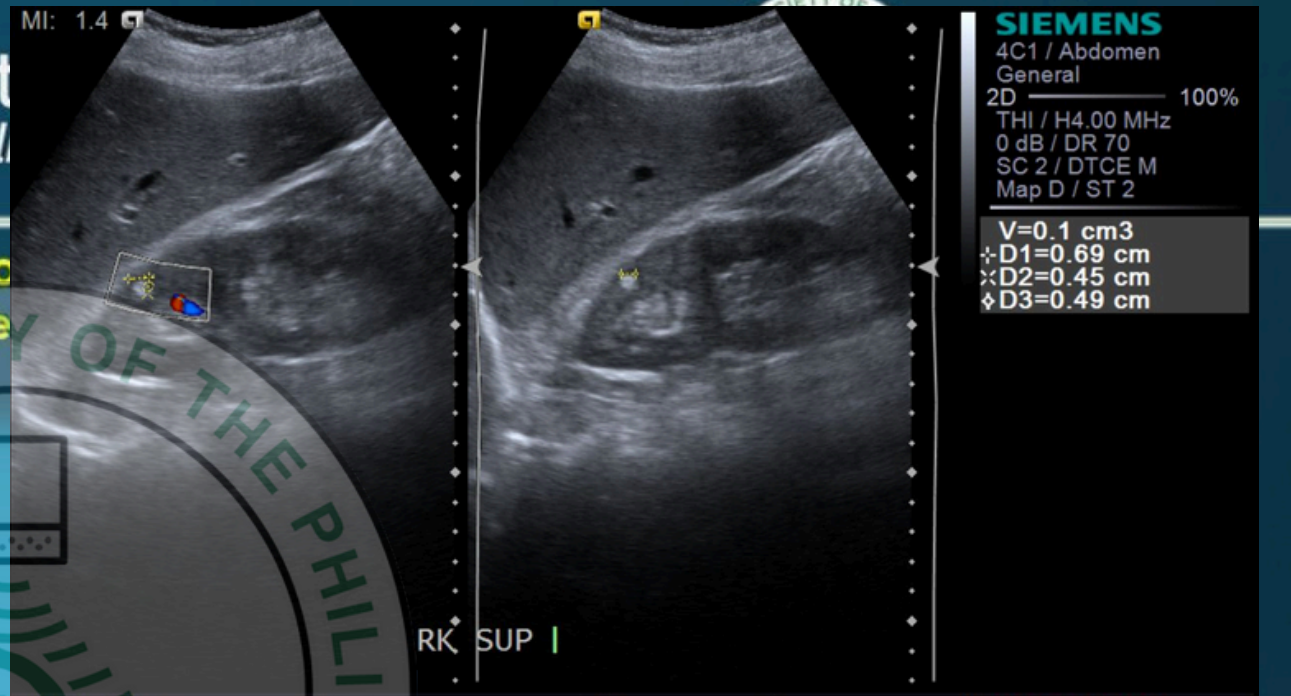
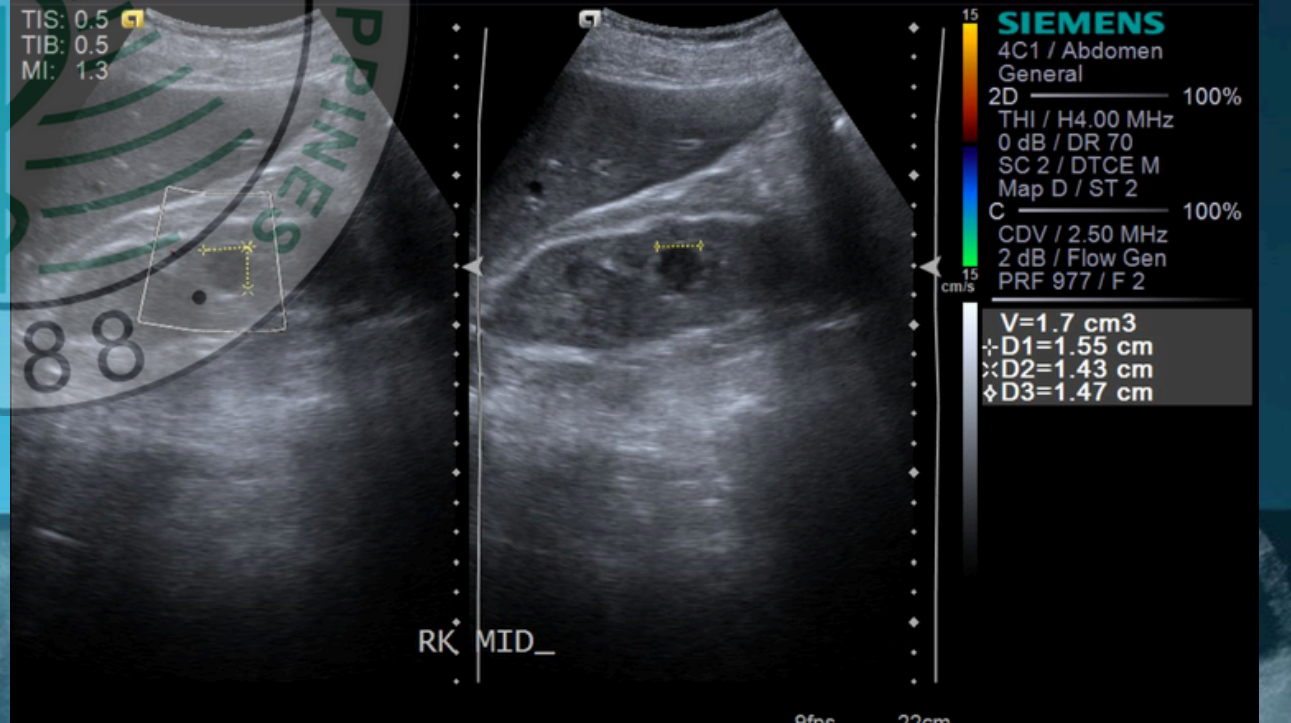
ABDOMINAL PAIN

37/M









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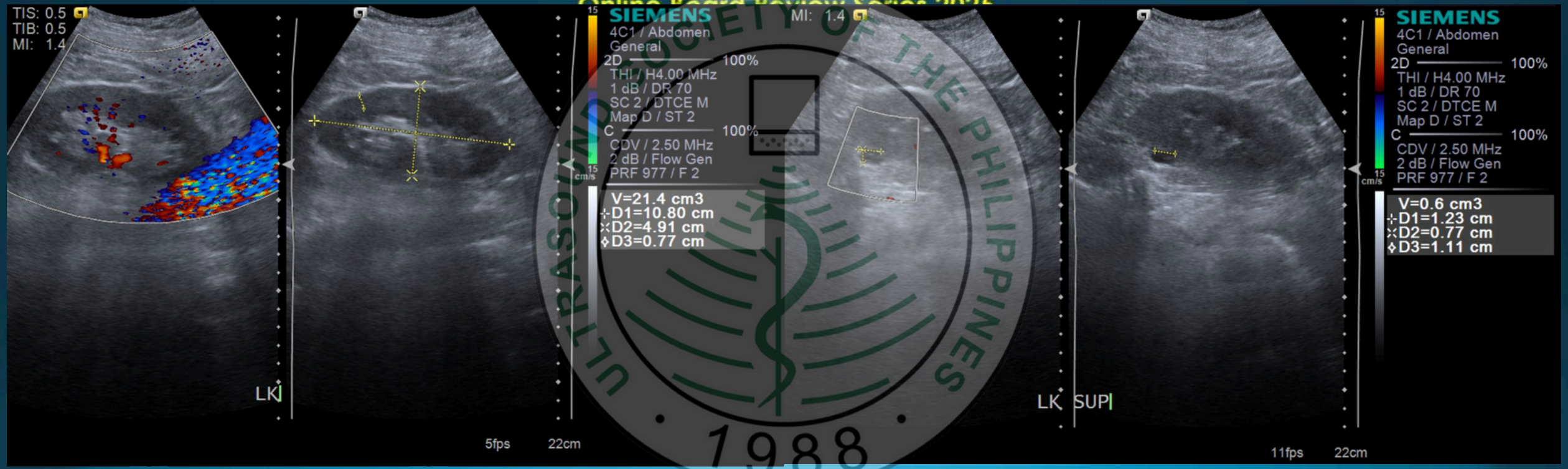

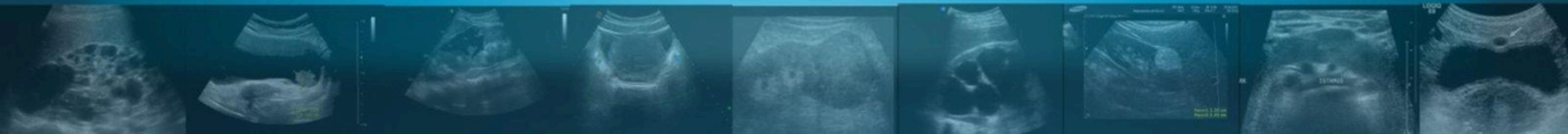

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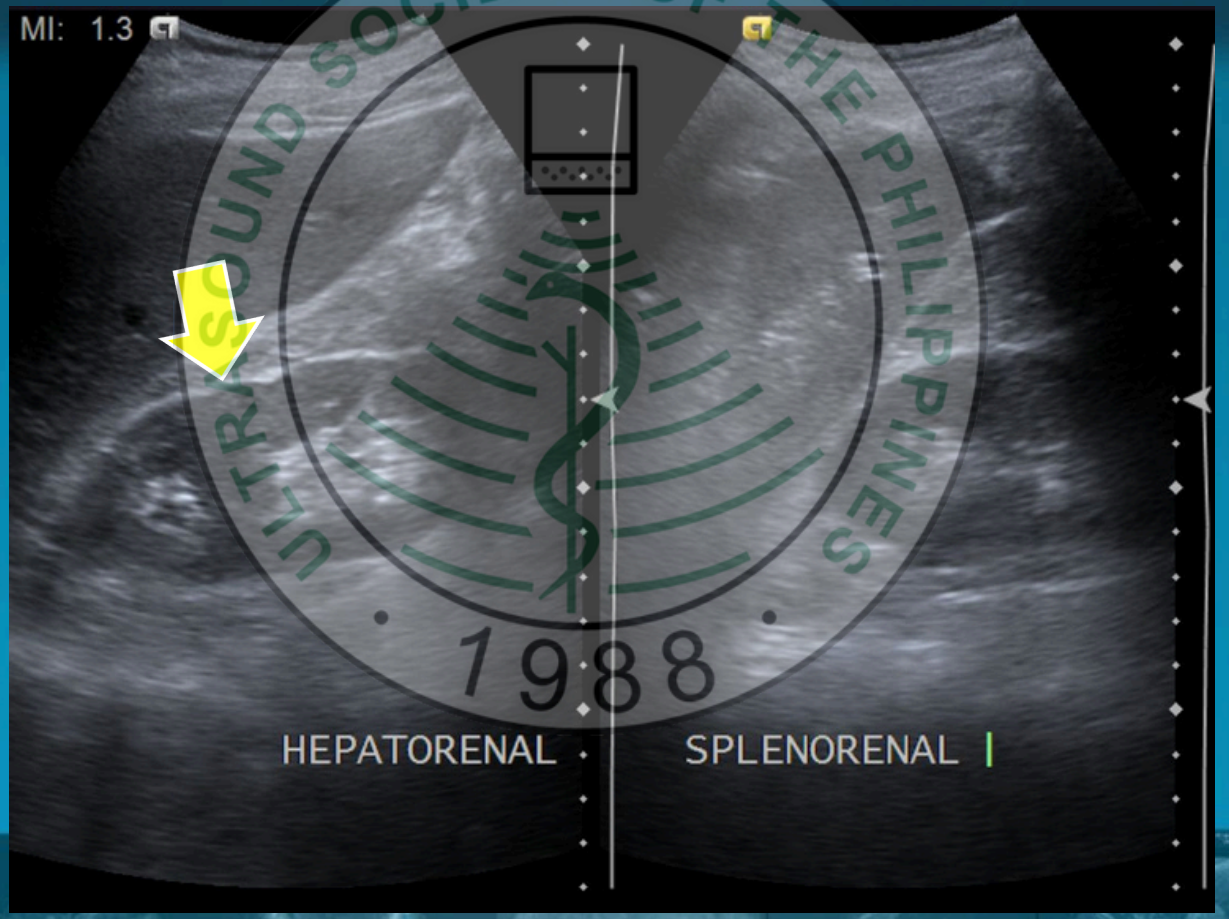

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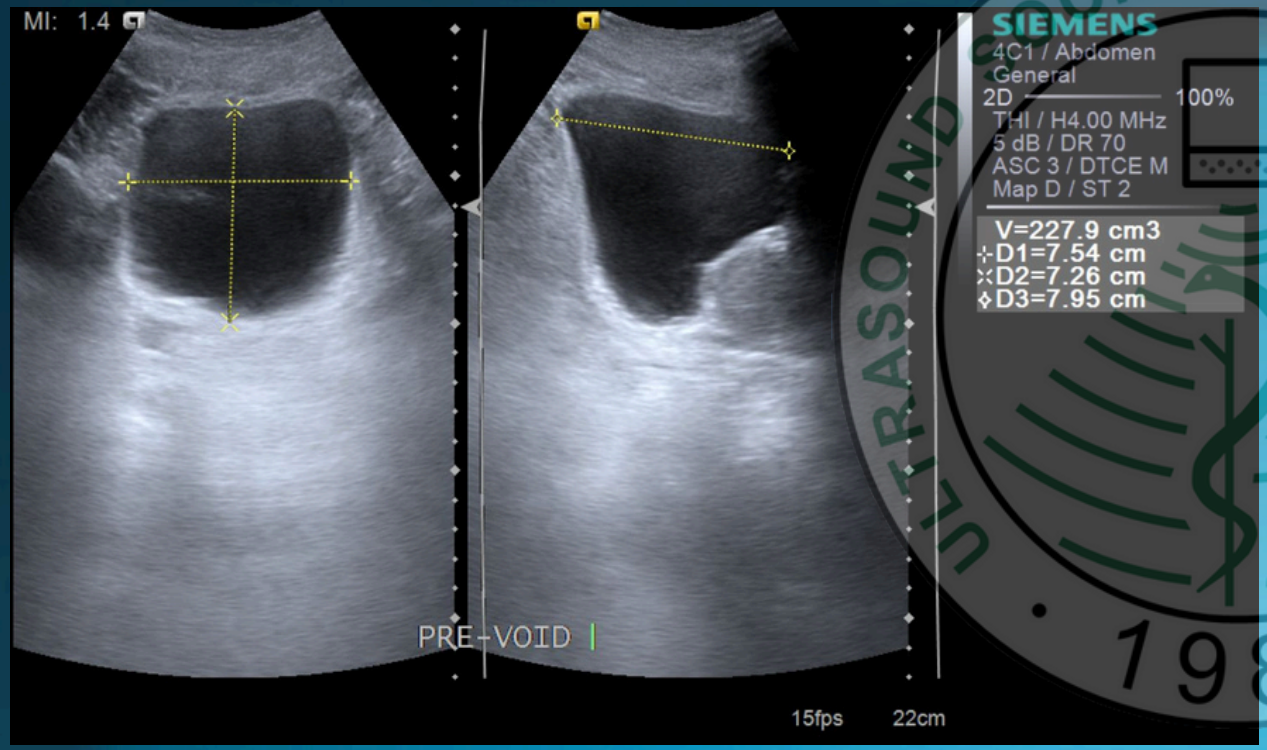

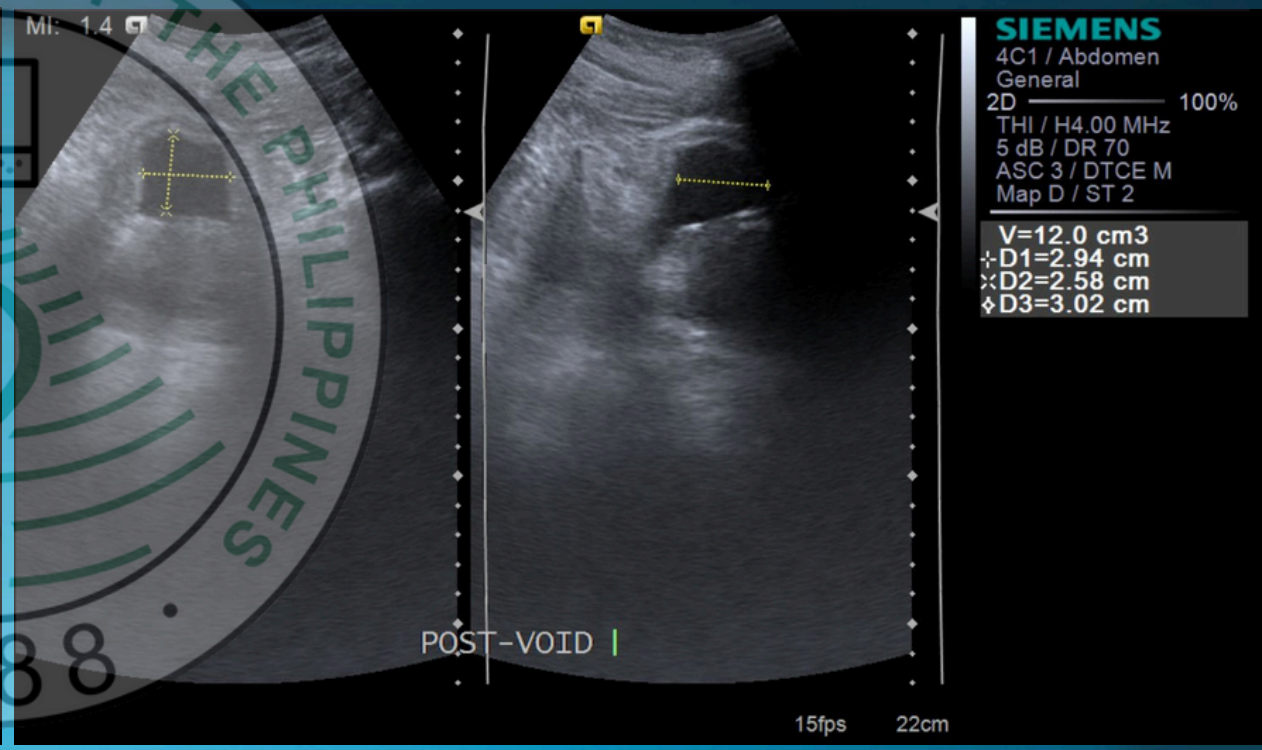

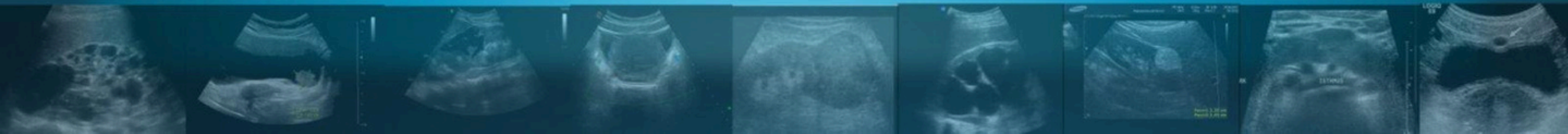

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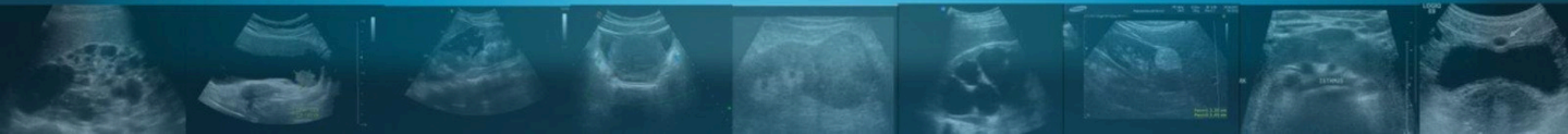
IMPRESSION

- NORMAL-SIZED KIDNEYS WITH DOUBLE COLLECTING SYSTEM ON THE RIGHT AND BILATERAL CYSTS
- SONOGRAPHICALLY NORMAL URINARY BLADDER



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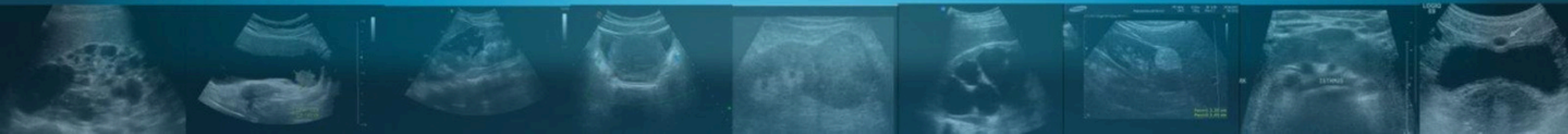
DUPLEX COLLECTING SYSTEM



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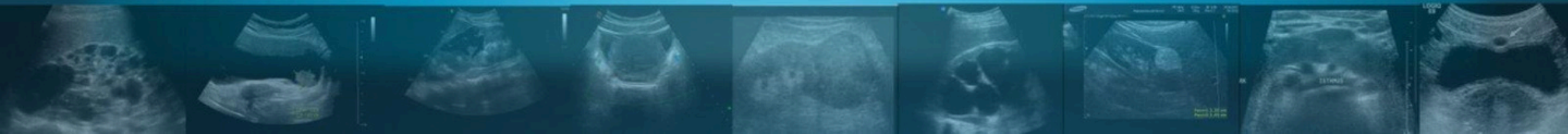
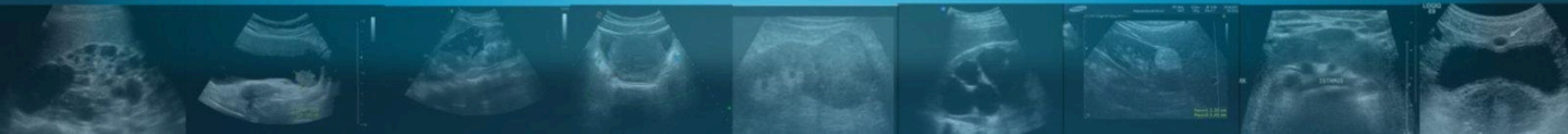
DUPLEX COLLECTING SYSTEM

- mostcommoncongenital anomalyoftheurinarytract, with an incidence of 0.5% to 10% of live births.



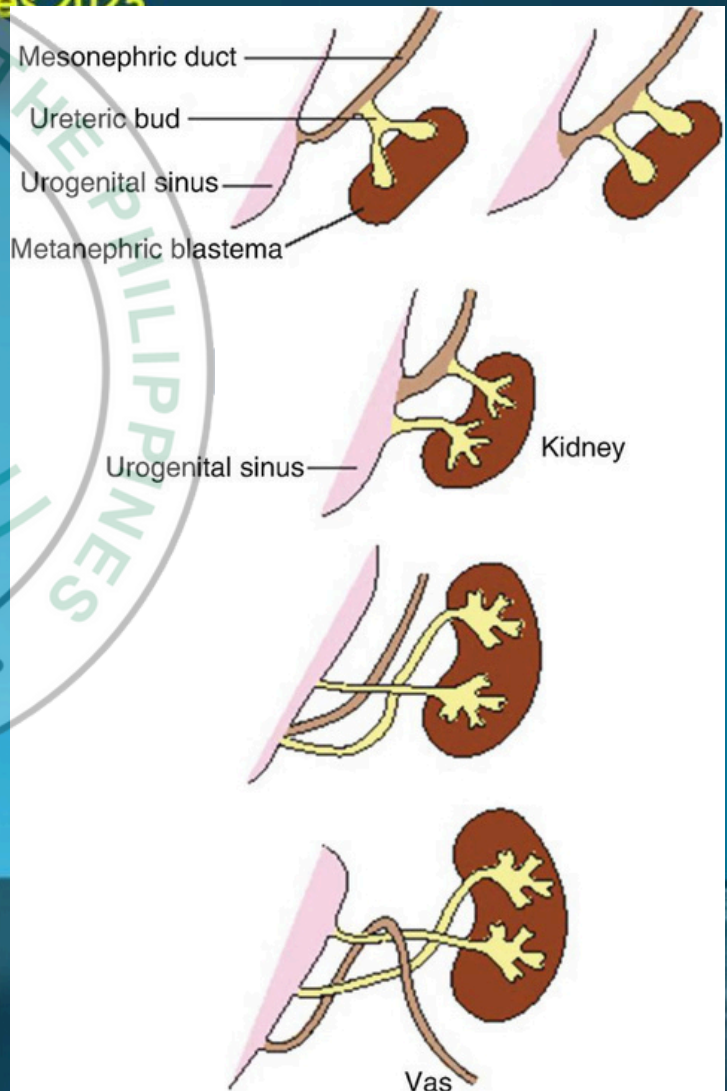
INCOMPLETE VERSUS COMPLETE

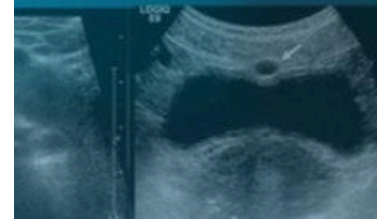
- complete duplex collecting system - two separate collecting systems and two separate ureters, each with their own ureteral orifice.
- Incomplete duplex collecting system - ureters join and enter the bladder through a single ureteral orifice.



FORMATION

- Arises when two ureteral buds form and join with the metanephrogenic blastema or when there is division of a single ureteral bud early in embryogenesis.





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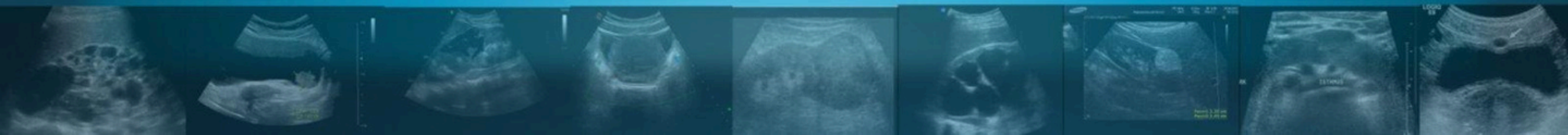
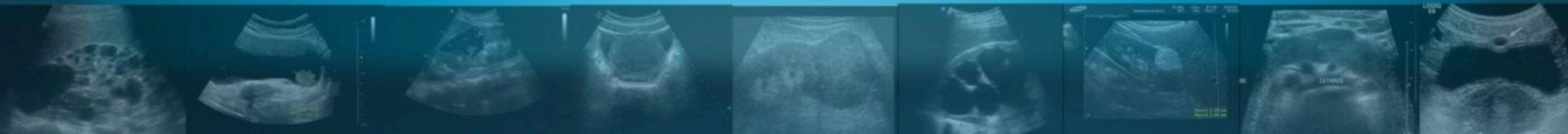
- Normally during embryologic development, the ureteral orifice migrates superiorly and laterally to become part of the bladder trigone.
- With complete duplication, the ureter from the lower pole of the kidney migrates to assume its normal location, whereas the ureter draining the superior pole of the kidney migrates abnormally to a more medial and inferior ureteral orifice.



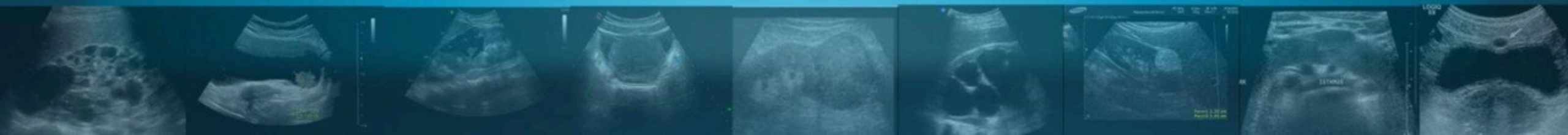
COMPLETE DUPLICATION

- the ureterdraining the lower pole has a more perpendicular course through the bladder wall, making it more prone to reflux. The ectopic ureter from the upper pole is prone to obstruction, reflux, or both.



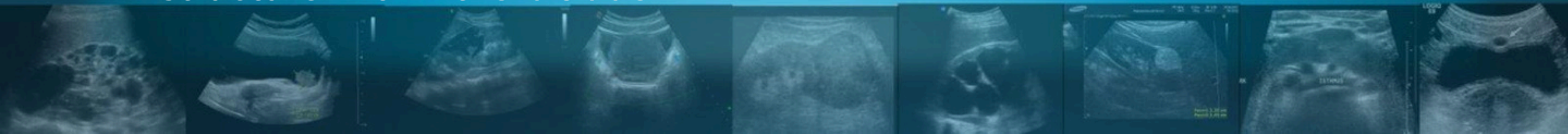
WEIGERT-MEYER LAW

- upper renal moiety ureter has ectopic insertion medial and inferior to the lower renal moiety ureter, and frequently ends in a ureterocele
- lower renal moiety ureter has orthotopic insertion lateral and superior to the upper renal moiety ureter, and vesicoureteral reflux can occur



SONOGRAPHIC FINDINGS

- duplex collectingsystem is seen astwo central echogenic renal sinuses with intervening, bridging renal parenchyma. Unfortunately, this sign is insensitive and is only seen in 17% of duplex kidneys.
- Hydronephrosis of the upper-pole moiety and visualization of two distinct collecting systems and ureters are diagnostic.
- the bladder should always be carefully evaluated for the presence of a ureterocele. A ureterocele will appear as a round, cyst-like structure within the bladder



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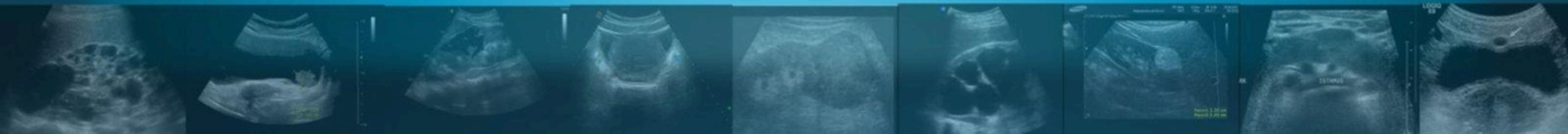
Case # 6



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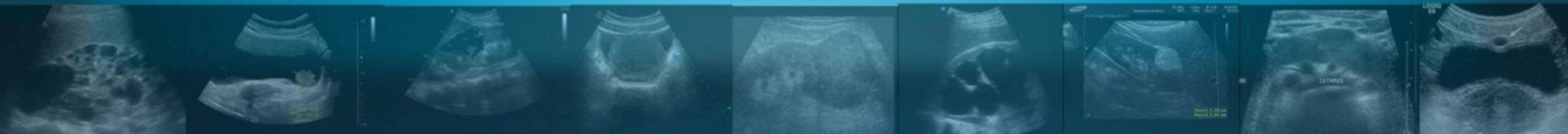
ASYMPTOMATIC/MONITORING

68/F



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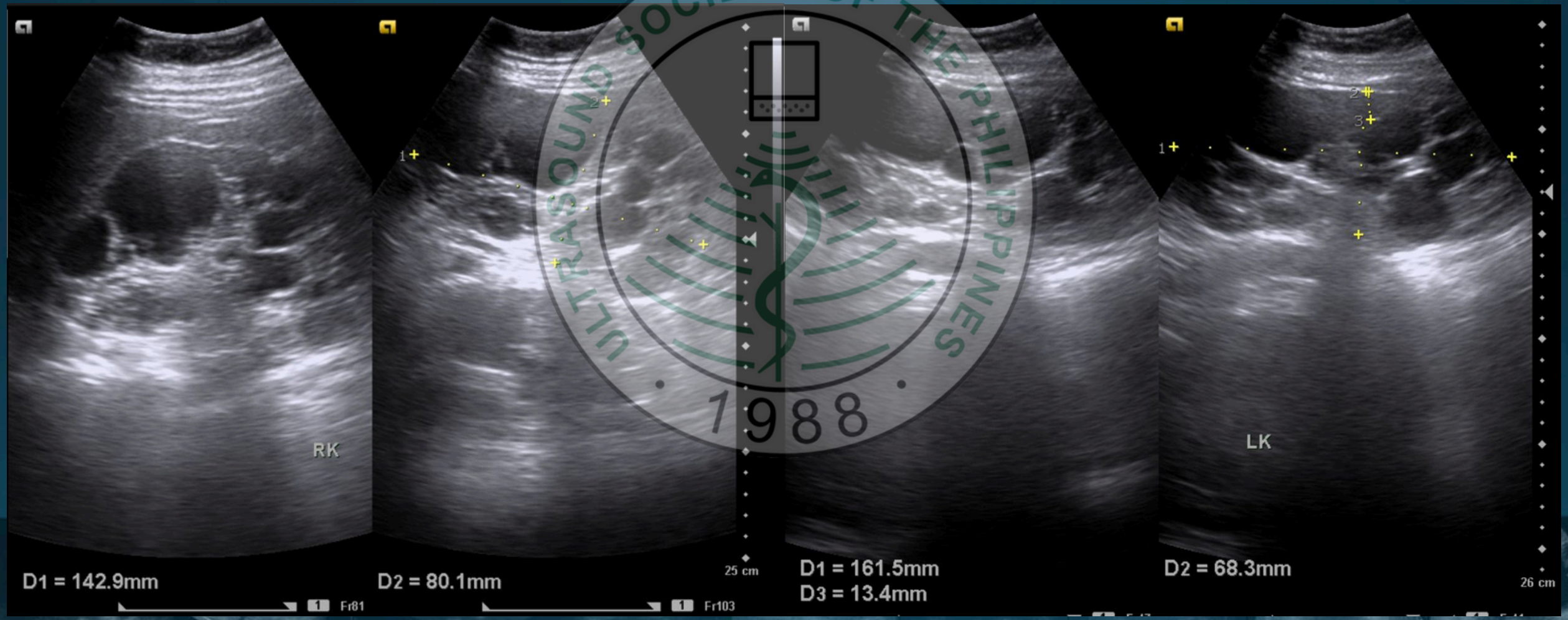

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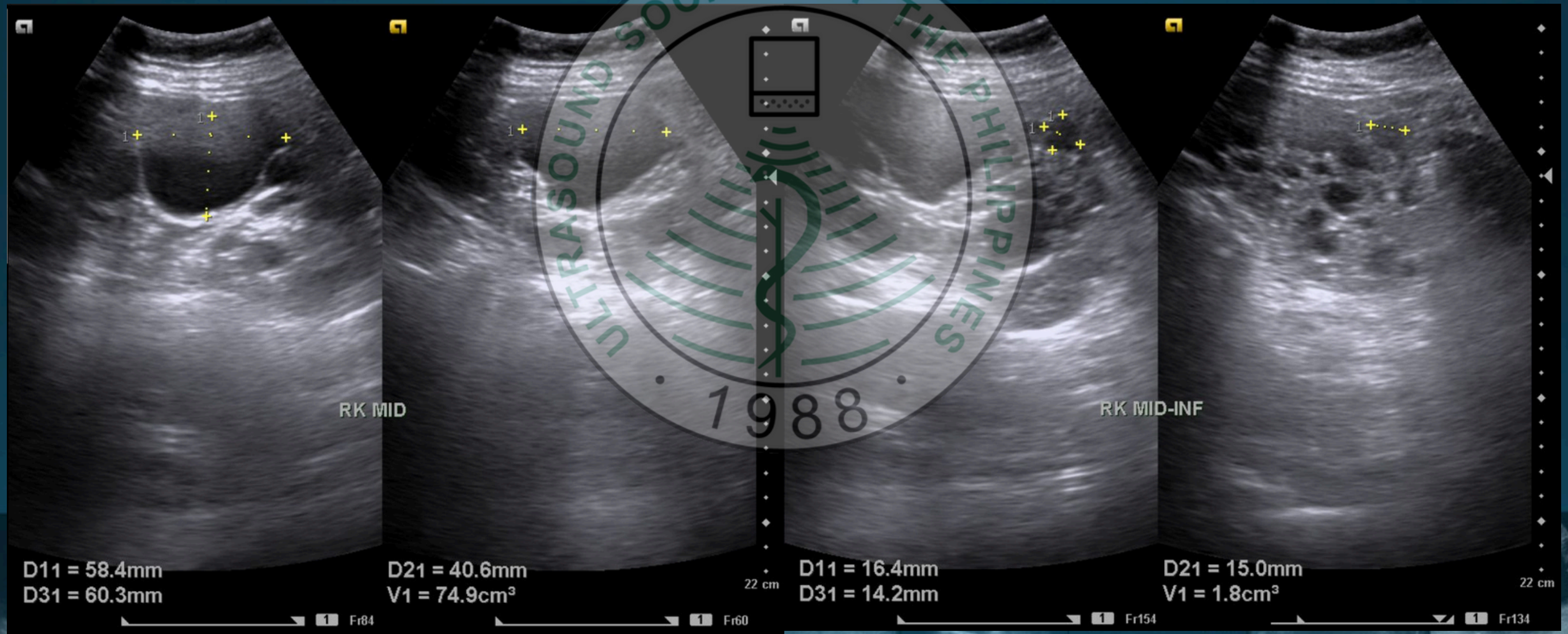
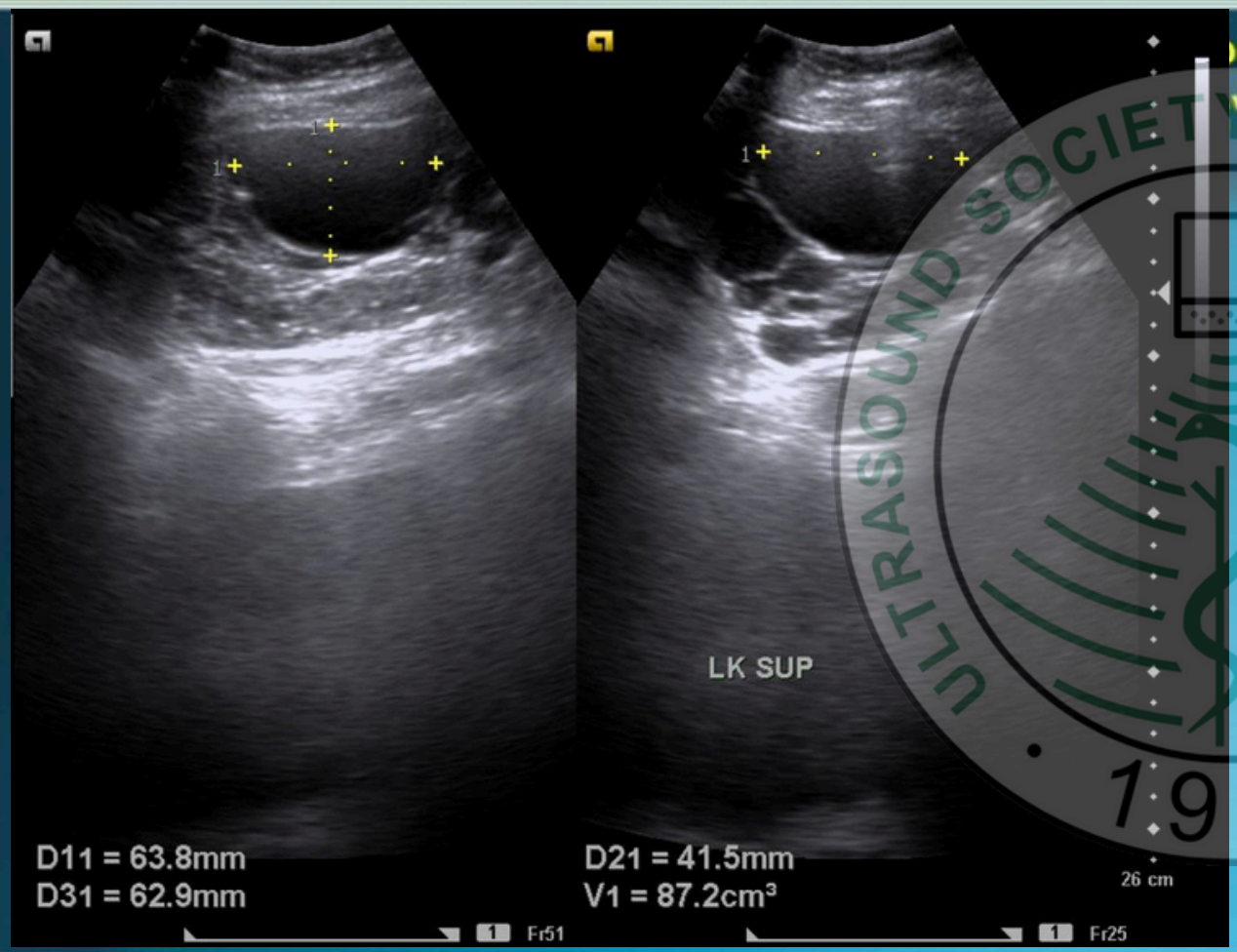
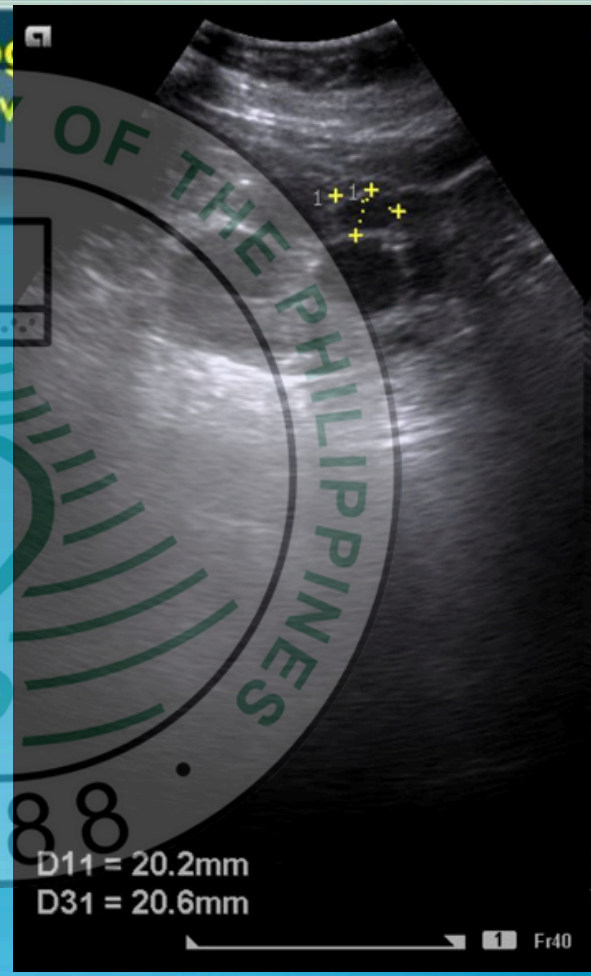
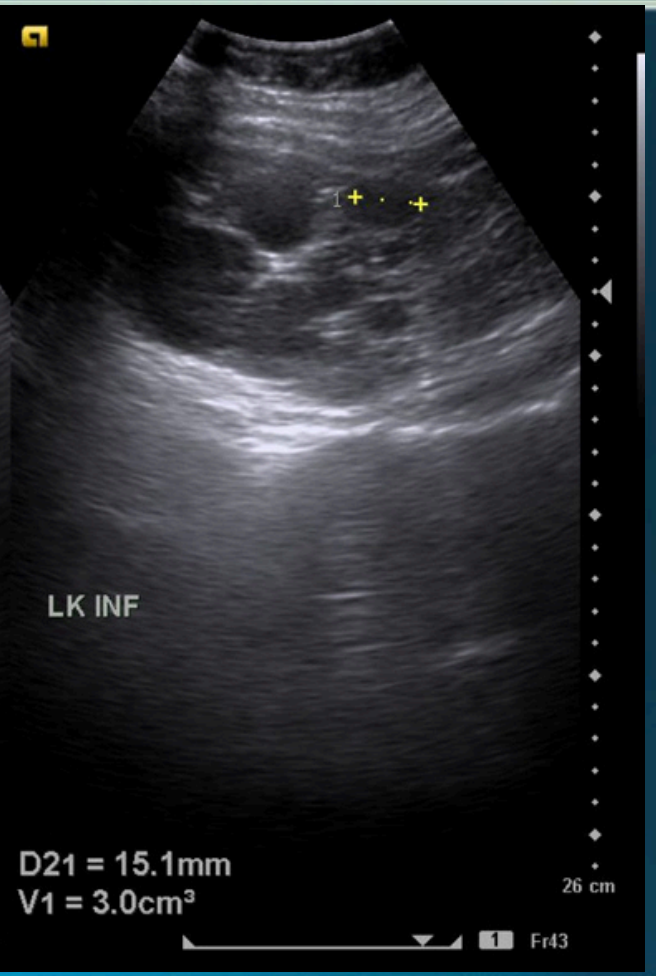
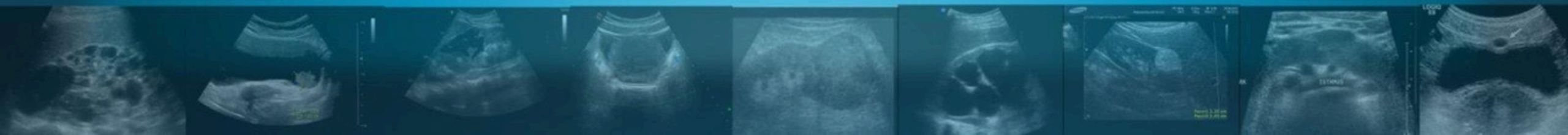



D11 = 63.8mm
D31 = 62.9mm
Fr51

LK SUP
D21 = 41.5mm
V1 = 87.2cm³
26 cm
Fr25


D11 = 20.2mm
D31 = 20.6mm
Fr40


LK INF
D21 = 15.1mm
V1 = 3.0cm³
26 cm
Fr43



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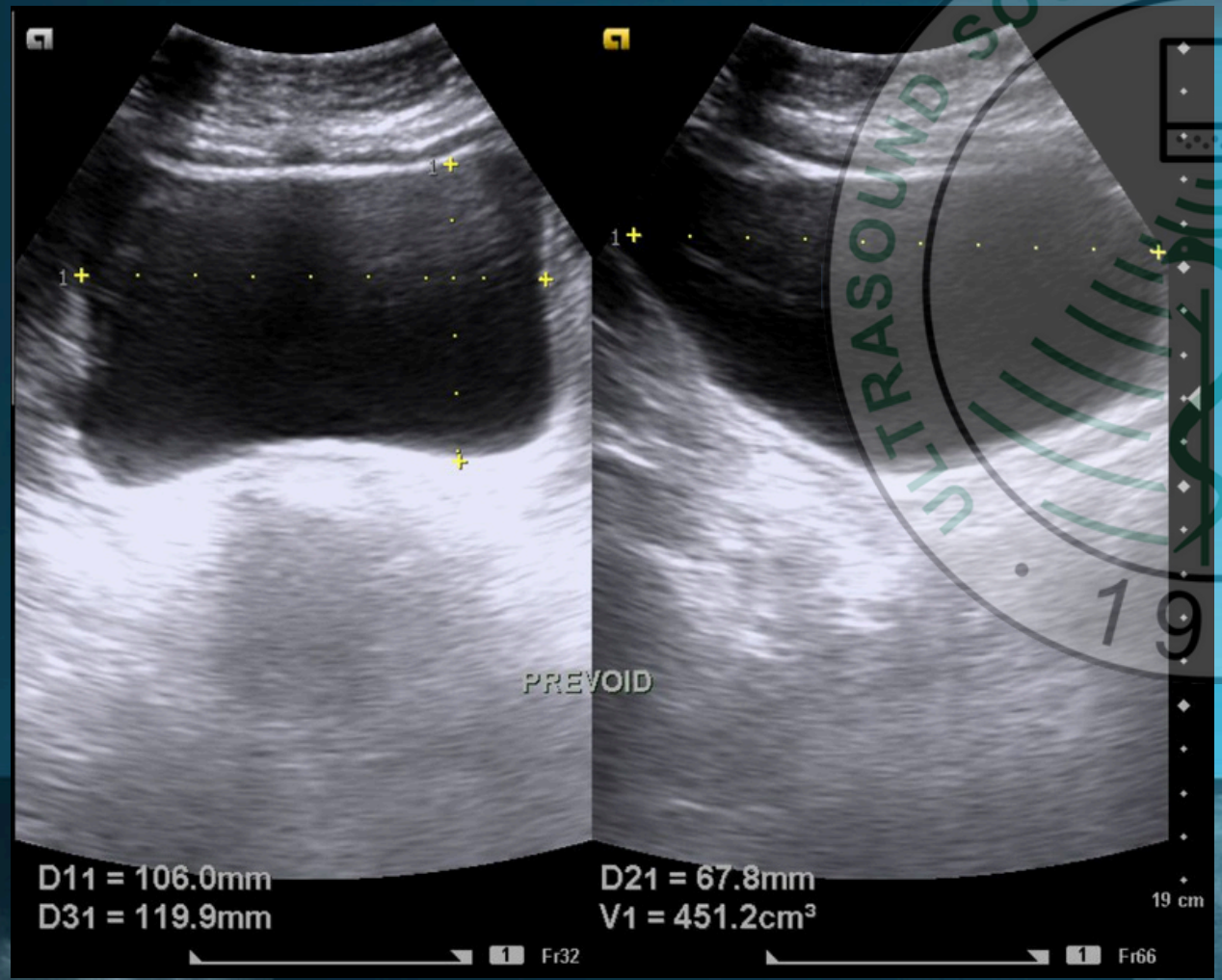
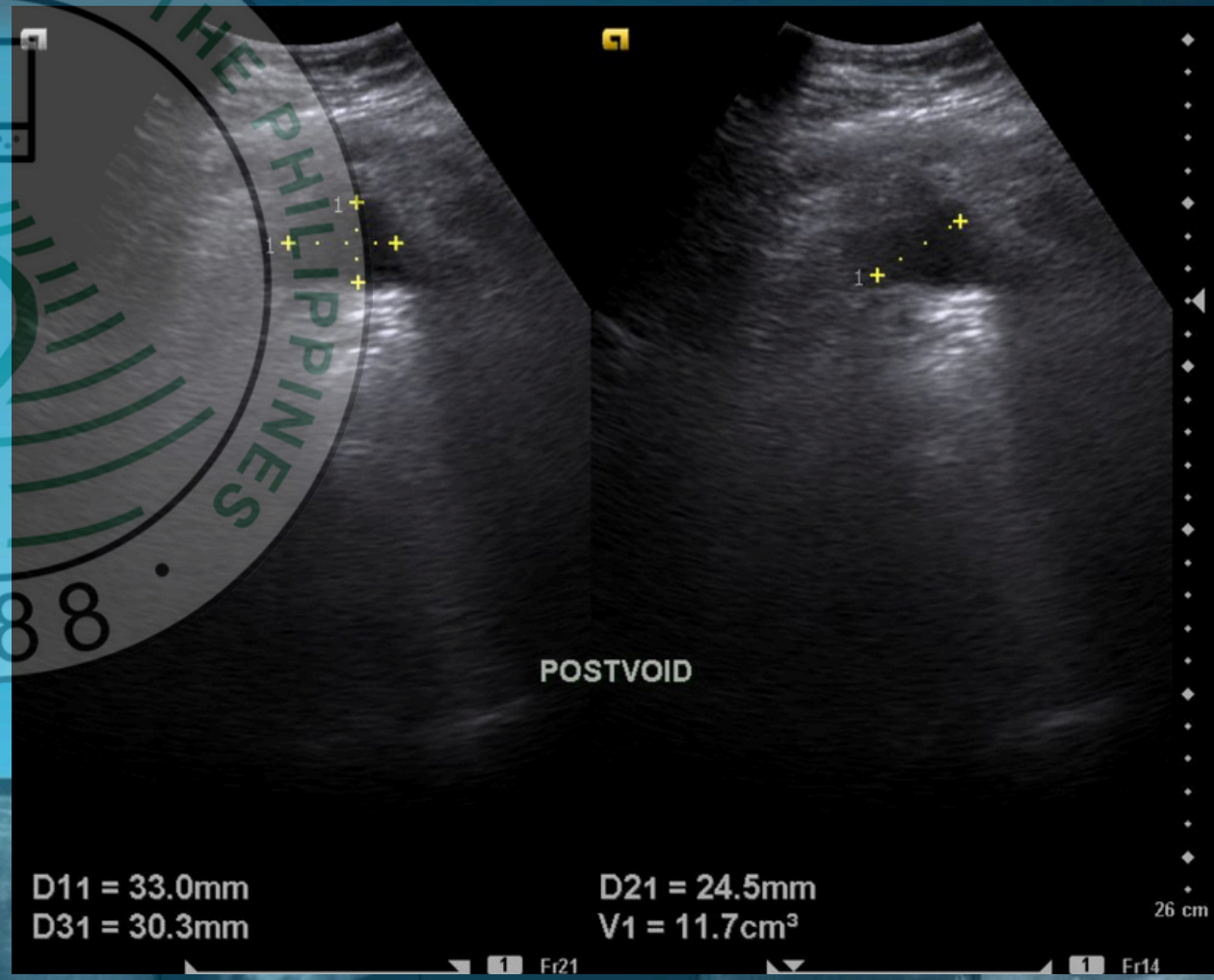
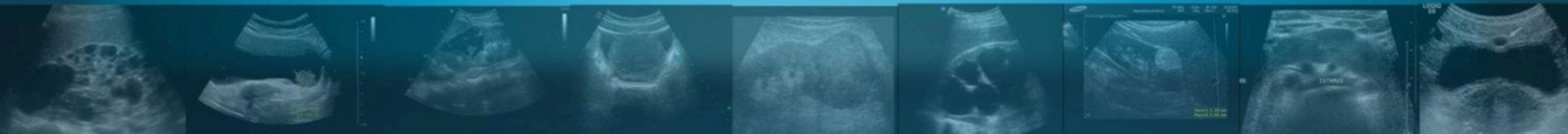




IMPRESSION

- ENLARGEDKIDNEYS WITH BILATERAL POLYCYSTIC KIDNEY DISEASE.
- SONOGRAPHICALLY NORMAL URETERS AND URINARY BLADDER.



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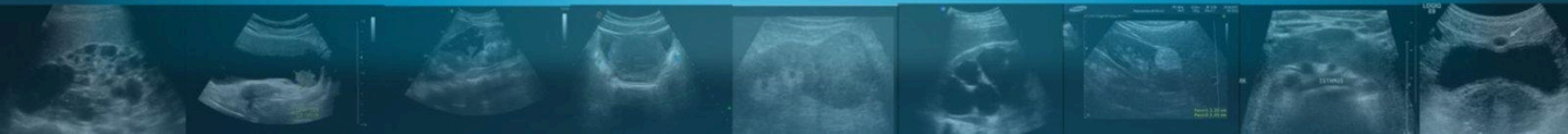
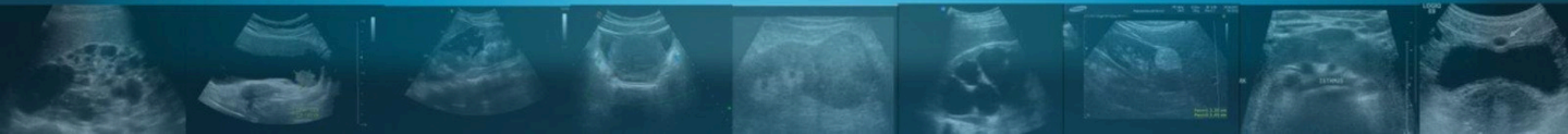
POLYCYSTIC KIDNEY DISEASE



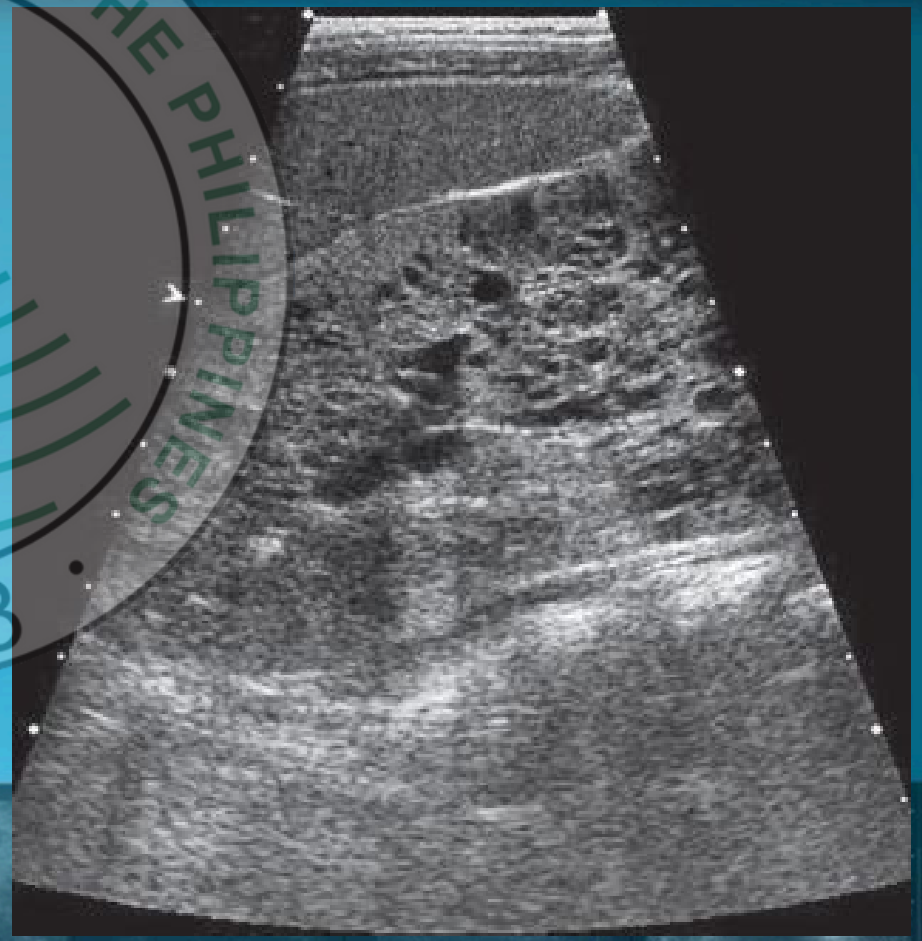
Polycystic kidney disease

- Autosomal recessive polycystic kidney disease **(ARPKD)** vs Autosomal dominant polycystic kidney disease **(ADPKD)**



ARPKD

- FOURTYPES: PERINATAL, NEONATAL, INFANTILE AND JUVENILE (DEPENDING ON THE **AGE OF ONSET**)
- Younger patients → renal insufficiency
- Older patients → hepatic involvement
- 1:6000 to 1:14, 000 liver births



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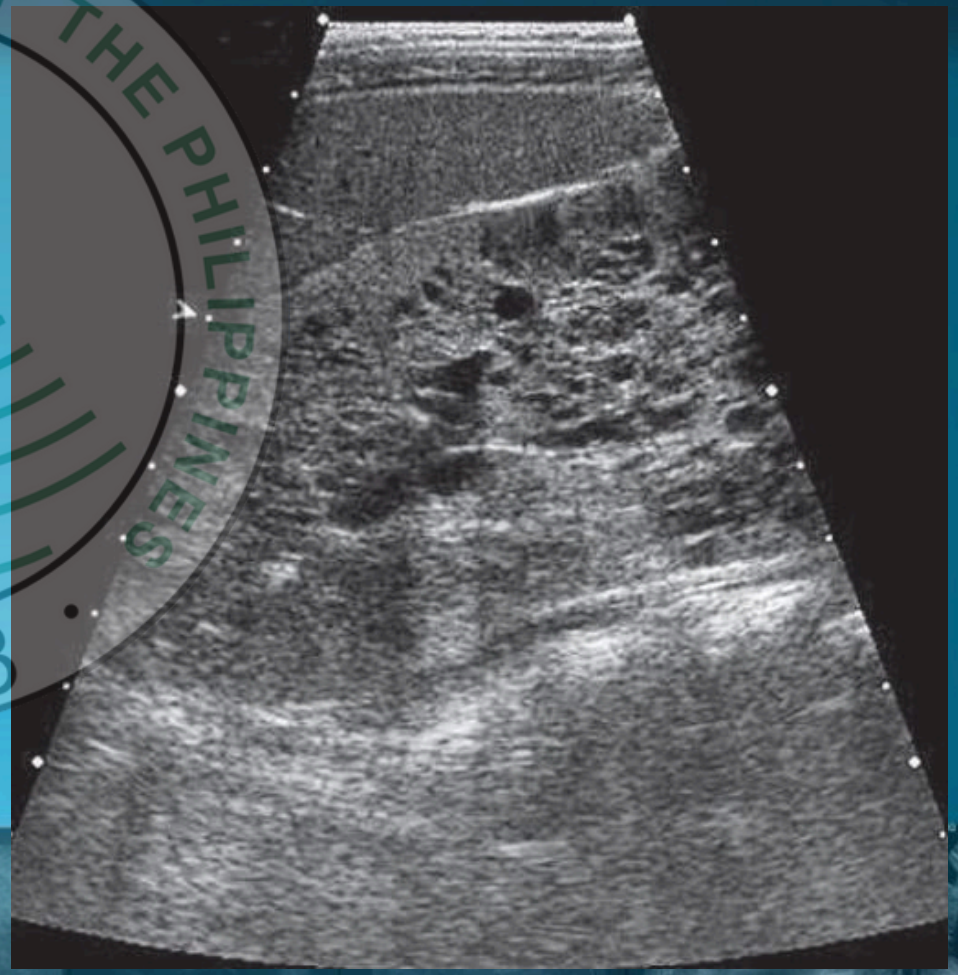
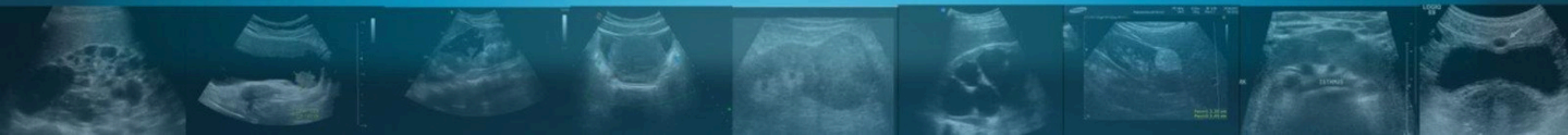
ARPKD (ultrasound findings)

- Lack of corticomedullary differentiation
- Massively enlarged echogenic kidneys
- Macroscopic cysts



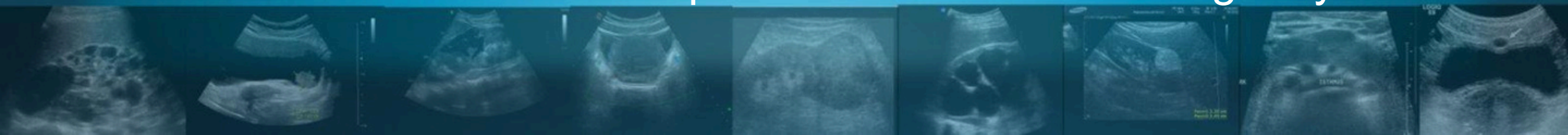
ADPKD

- Large number of bilateral cortical and medullary renal cysts
- Most common hereditary renal disorder and has no gender predilection
- 1:500 to 1:1000 and accounts to 10 – 15% of patients receiving dialysis
- 50% of patients have no family history
- Signs and symptoms: palpable masses, pain, hypertension, hematuria and UTI (develops on 4th to 5th decade of life)
- Renal failure develops in 50% of patients by age of 60



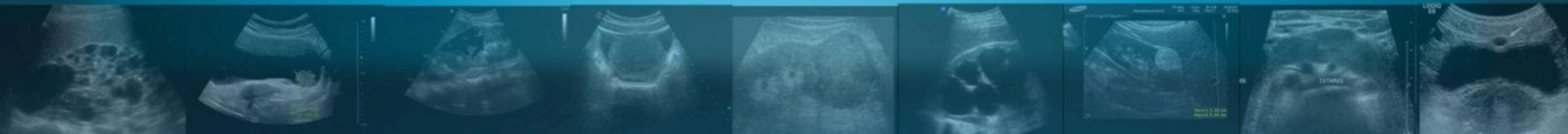
ADPKD - COMPLICATIONS

- Infection
- Hemorrhage
- Stone formation
- Cyst rupture
- Obstruction
- Stone formation – occur in patients with more and larger cysts



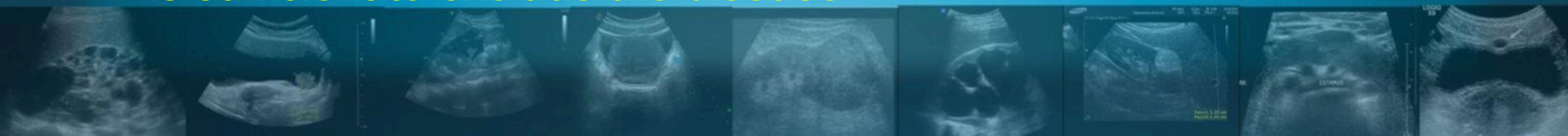
ADPKD – ASSOCIATED ANOMALIES

- Livercysts (30-60%)
- Pancreatic cysts (10%)
- Splenic cysts (5%)
- Cyst in thyroid, ovary, endometrium, seminal vesicles, lung, brain, pituitary gland, breast and epididymis
- Cerebral berry aneurysms (18-40%)
- Abdominal aortic aneurysm
- Cardiac lesions
- Colonic diverticula



ADPKD DIAGNOSTIC CRITERIA (RAVINE ET AL)

- <30 years old+familyhistoryofadpkd:requirestwo(2)renal cysts in total
  - can be unilateral or bilateral (one on each kidney)
- 30 to 59 years old + family history: two cysts in each kidney
- >60 years old: four cysts in each kidney
- *** fewer than two renal cyst in at-risk individuals older than 40 is sufficient to exclude the disease



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THANK YOU!