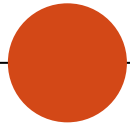




Ultrazvuk břicha v rukou intenzivisty



Michal Šitina

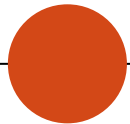
Anesteziologicko-resuscitační klinika, FN u Sv. Anny, Brno



Obsah

- ☉ Proč?
- ☉ Co nabízí UZ břicha pro IM a UM?

Proč?





Kdo provádí UZ břicha?

- ☉ ČR – **radiologové**, gastroenterologové
- ⊙ Německo – **ošetřující lékař** (internista, chirurg, intenzivista, urolog), gastroenterolog, výjimečně radiolog



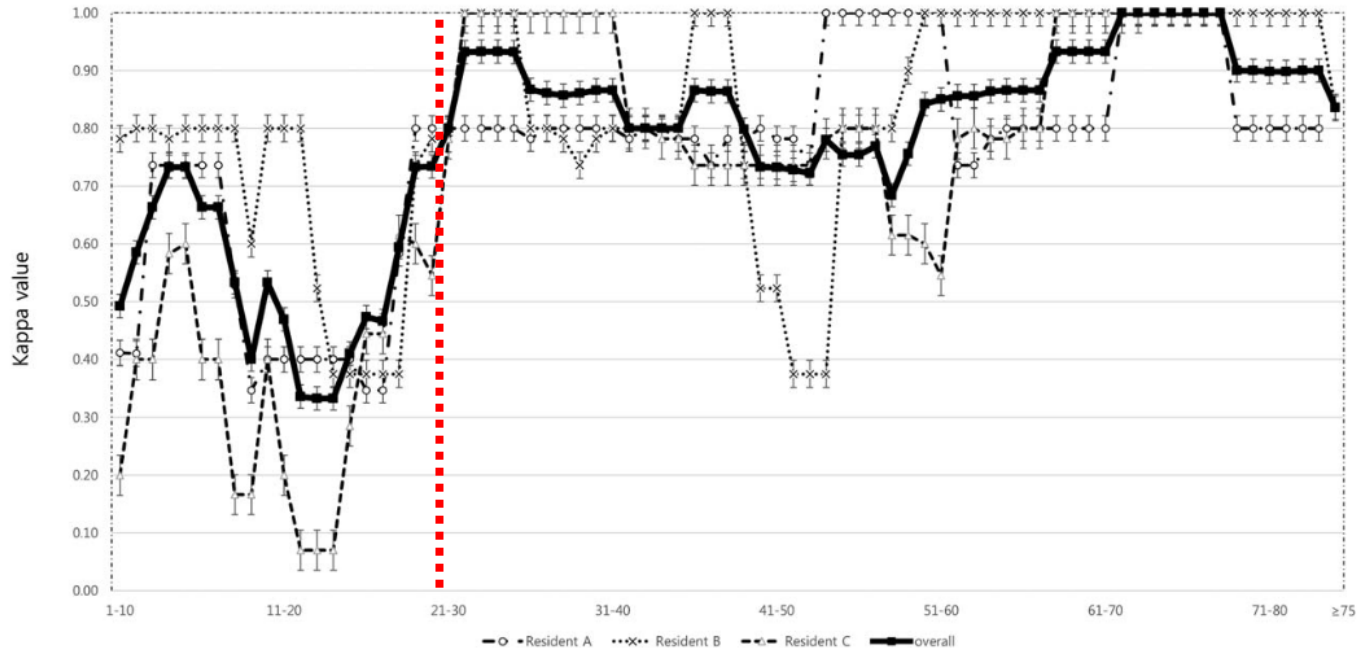
UZ srdce x UZ břicha

- ⊙ Echokardiografie
 - **nezbytná** dovednost intenzivisty
 - součást hemodynamického monitorování
- ⊙ UZ břicha
 - převážně morfologie a stanovení „diagnózy“
 - **volitelná** dovednost – lze téměř vždy „nahradit“ radiologem

UZ břicha v IM/UM je poměrně snadný

The learning curve in diagnosing acute appendicitis with emergency sonography among novice emergency medicine residents

J Clin Ultrasound. 2018;1-6.



● UZ břicha v IM/UM je poměrně snadný

◎ relativně rychlá učicí křivka (měsíce)

- bazální UZ-anatomické znalosti
- znalost obrazů patologií
- lze se „učit“ od radiologů
- vhodný je úvodní kurz
 - www.csum.cz

Abdominální sonografie - Základní kurz,

lánován na 23.-25.září 2022.

◎ základní dovednosti stačí na správné zhodnocení

> 70 % případů

- nutná sebekritičnost (Jsem si jistý tím, co vidím?)



UZ v rukou intenzivisty

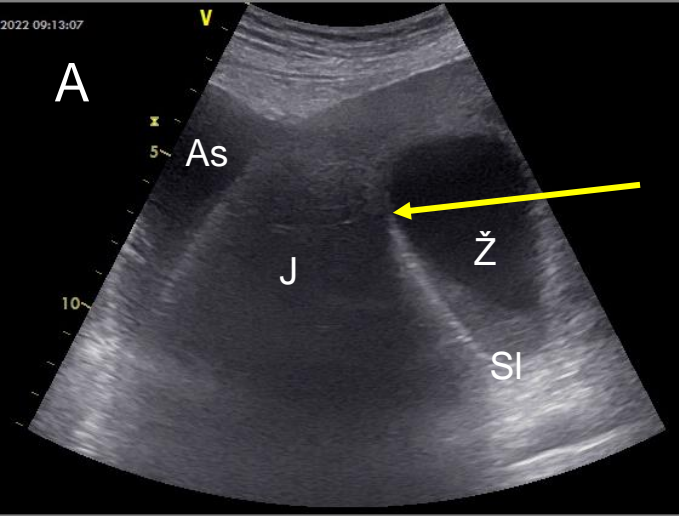
⊙ **komplexní zhodnocení pacienta během 5-10 minut**

- UZ srdce – selhání LK/PK, plicní hypertenze, významné chlopenní vady, perikardiální výpotek, preload...
- UZ plic – pleurální výpotek, PNO, B-lines, atelektáza...
- **UZ břicha**
 - **volná tekutina, městnání ledvin, velikost ledvin, retence moči, aneuryzma aorty, ileus, biliární dilatace, cirhóza, trombóza porty, metastázy v játrech, velký hematom, těhotenství...**
- UZ žil (v. femoralis + v. poplitea) – vyloučení/potvrzení HŽT
- TCD, UZ n. opticus

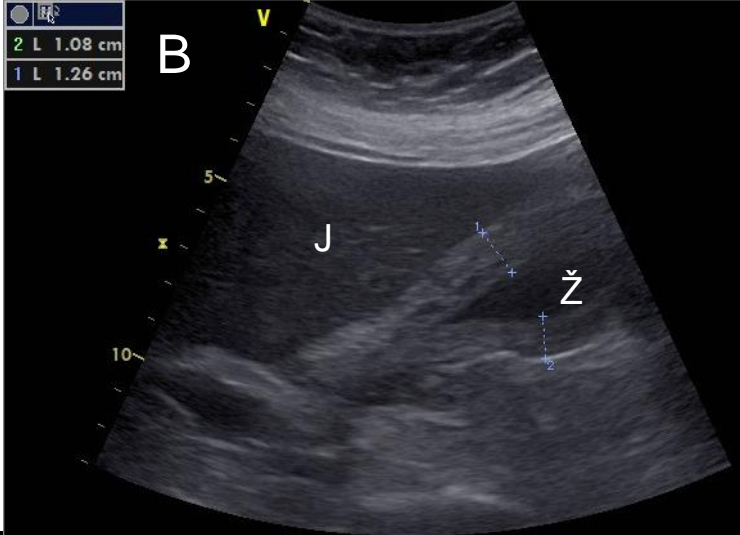


Proč UZ břicha v rukou intenzivisty ?

- ⦿ zábava
- ⦿ relativně snadná technika
- ⦿ vyloučení/diagnostika základních patologií
- ⦿ rychlé komplexní posouzení
- ⦿ vývoj v čase
- ⦿ invazivní výkony – punkce nejasného ložiska tenkou jehlou

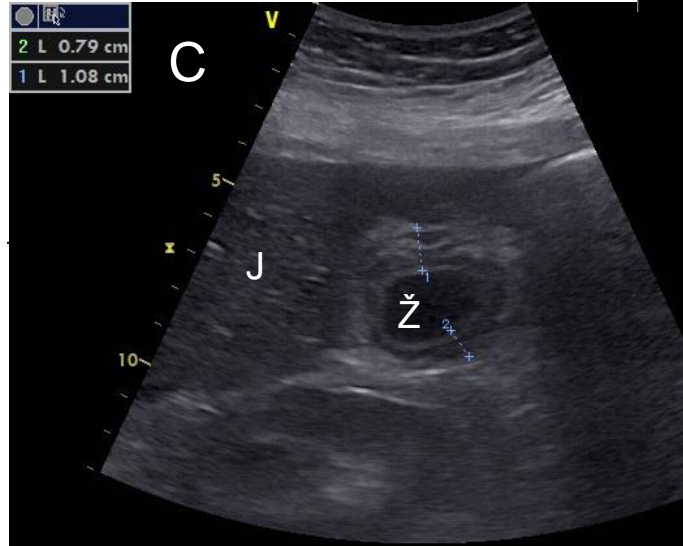


2 L 1.08 cm
1 L 1.26 cm

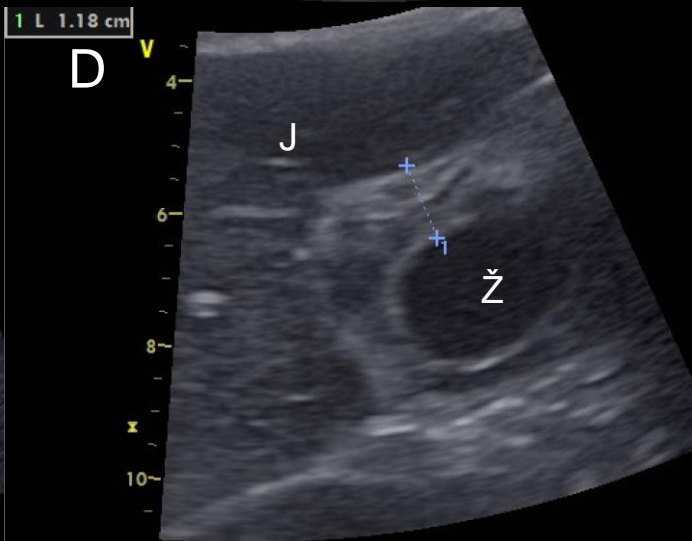


Akalkulozní cholecystitida

2 L 0.79 cm
1 L 1.08 cm



1 L 1.18 cm



Jens Niehaus

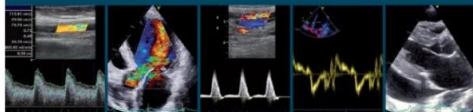
Sonografie

praktická příručka



Filip Burša a kol.

ULTRASONOGRAFIE



v intenzivní a urgentní
medicině

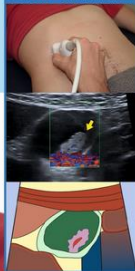
maxdorf jessenius

Sono Grundkurs

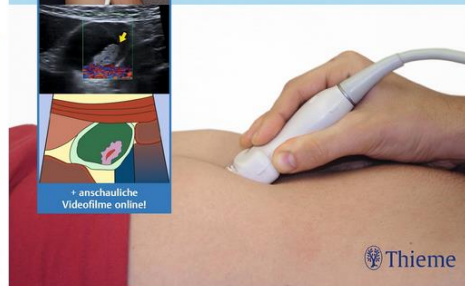
Ein Arbeitsbuch für den Einstieg

+ Online-Version in der eRef

Matthias Hofer

Mit GT-Bildmaterial von
Alexis Müller-Marbach4 in 1: SK-Haltung,
Sonobild + Anatomieskizze+ anschauliche
Videofilme online!

10. Auflage



Abdominal Ultrasound: Step by Step

Berthold Block

2nd edition



Thieme

DATEN UND FAKTEN

Leber: kraniokaudal: < 130 mm

- gleichmäßiges, homogenes Echomuster
- Winkel des rechten Leberunterrandes: < 45°
- Winkel des linken Leberunterrandes: < 30°
- Nieren- und Leberparenchym ca. gleiche Echogenität

Niere: Länge: 100-120 mm

- Parenchymsaum normal > 13 mm
- Parenchym-Pyelon-Index (PPI) nimmt mit dem Alter ab
- physiologisch 30-70 mm atemverschieblich

Gallenblase:

- Länge: < 100 mm, Querdurchmesser: < 40 mm, Wand: < 3 mm
- Gallengang: < 7 mm (< 11 mm nach Cholezystektomie)

Milz:

- Länge: 110 mm, Querdurchmesser: 70 mm, Dicke: 40 mm

Pankreas:

- Pankreasgang (Ductus wirsingianus): < 3 mm

Aorta: suprarenal: < 25 mm, infrarenal: < 20 mm

- einfache Pulsation

Pfortader: 12 ± 2 mm (Leberhilus)

V. cava: < 20 mm ± 50% Volumenschwankung

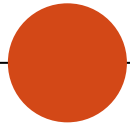
Uterus: Länge: 70-90 mm, Querdurchmesser: 40-60 mm, Dicke: 30-45 mm

Ovarien: Länge: 30-45 mm

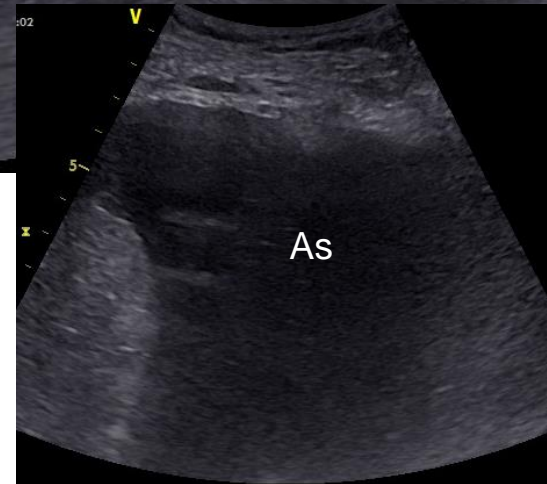
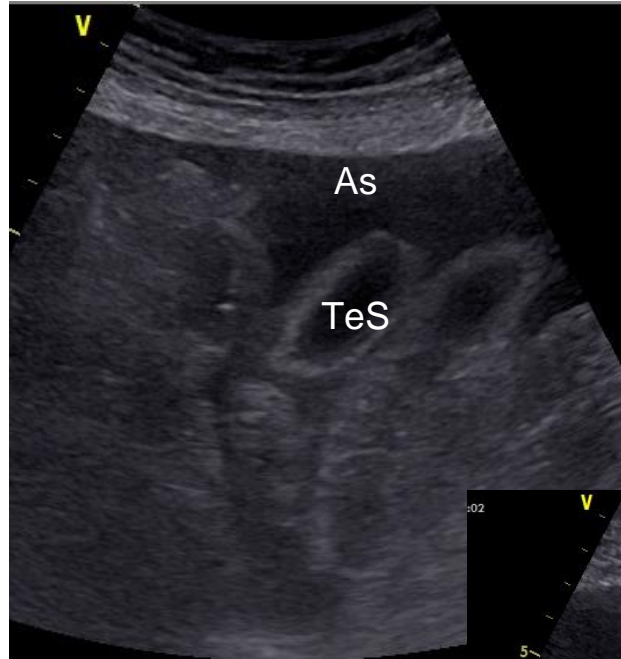
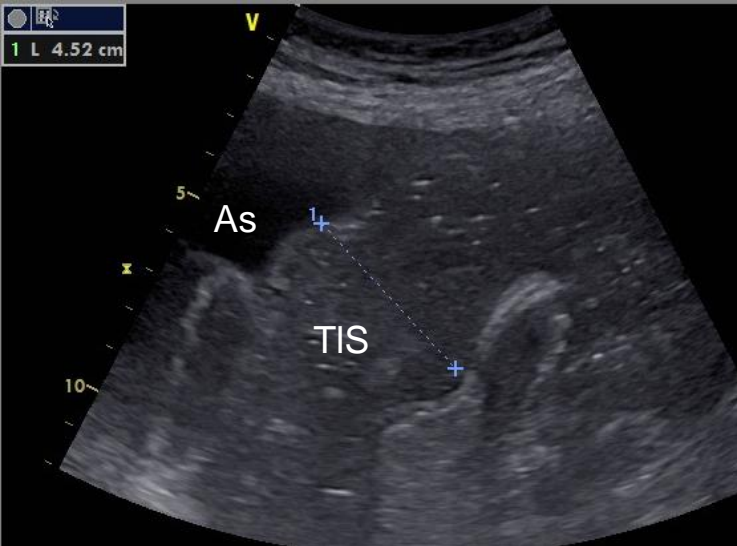
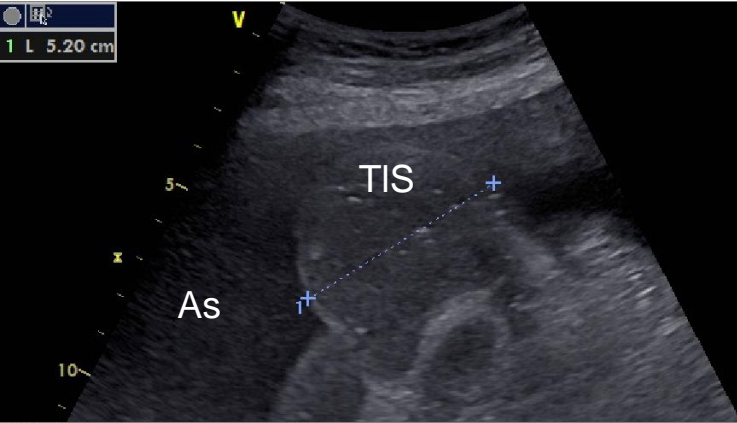
Prostata: Basis-Apex-Abstand: 30-40 mm

Harnblase: -Wanddicke gefüllt < 4 mm (leer < 8 mm)

UZ břicha v rukou intenzivisty pro IM/UM - příklady

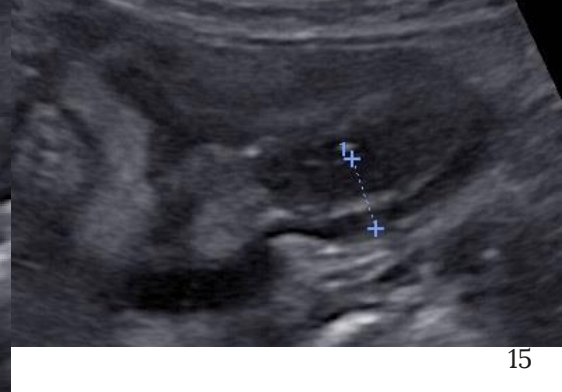
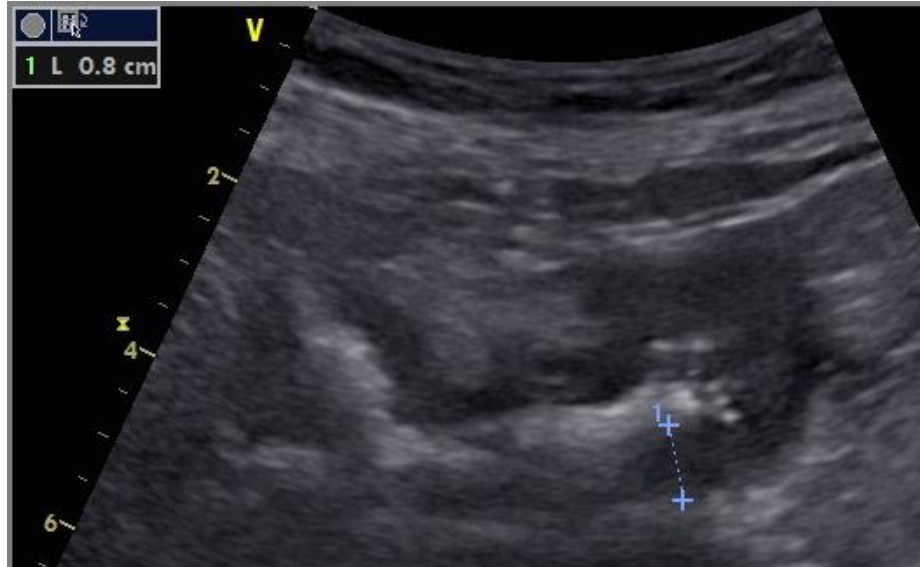
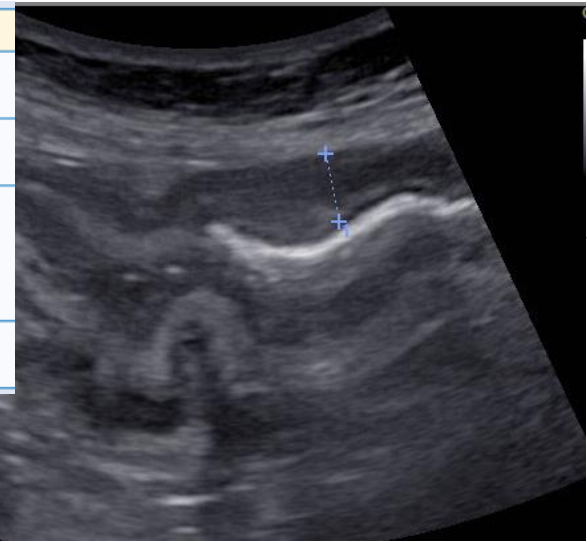
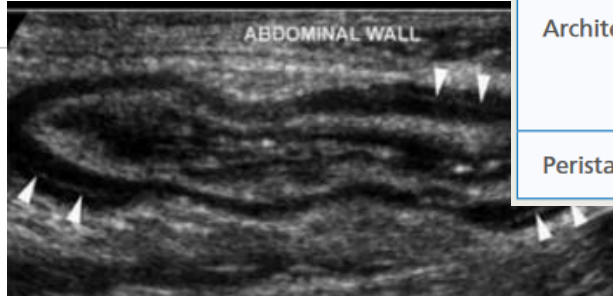


Dilatace střevních kliček – ascites

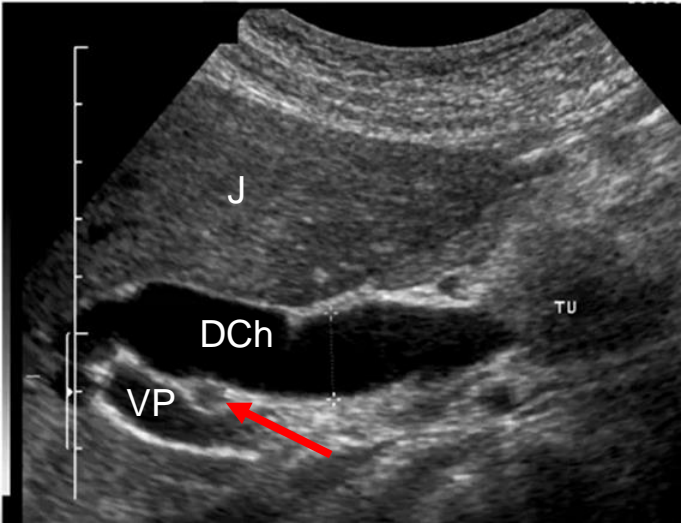
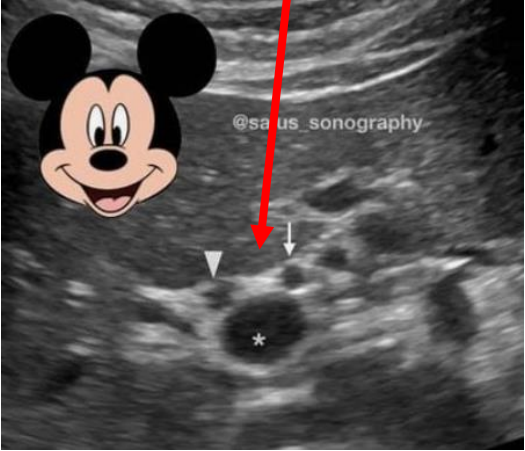
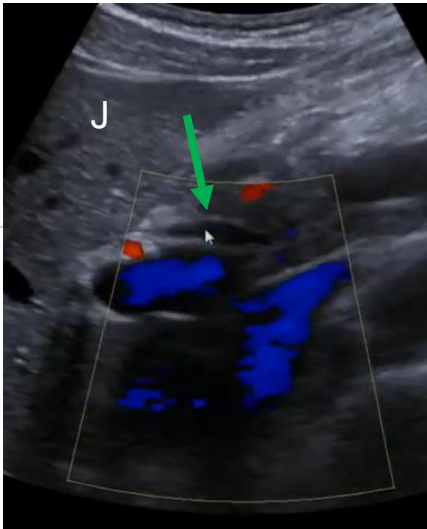
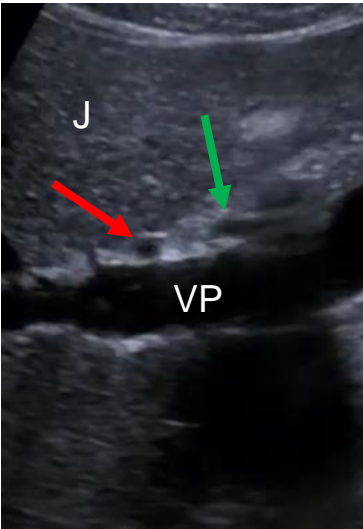
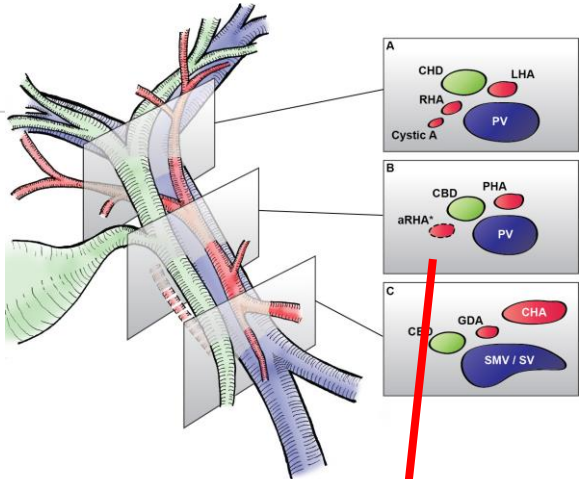


Kolitida

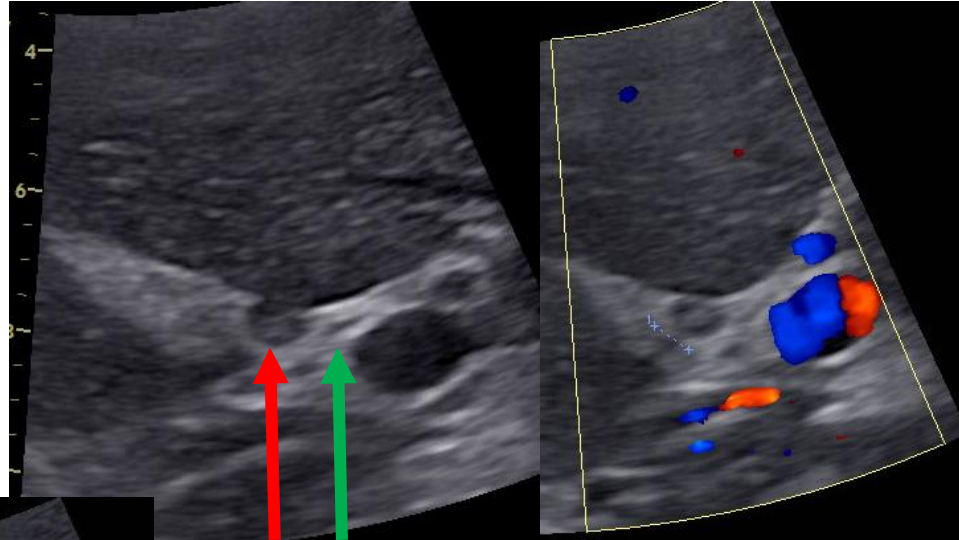
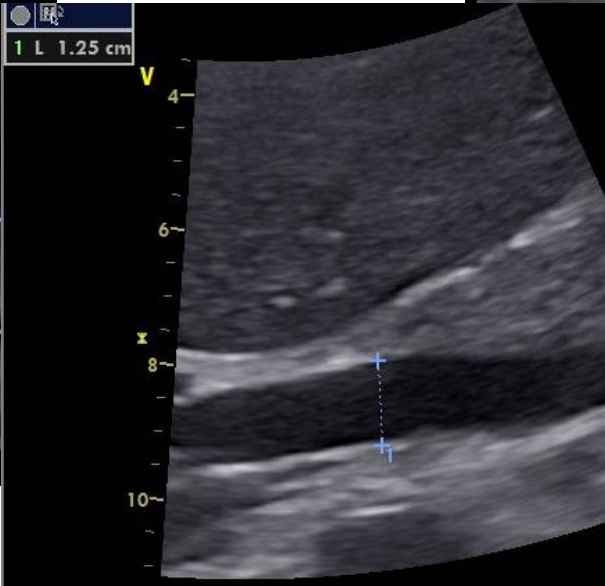
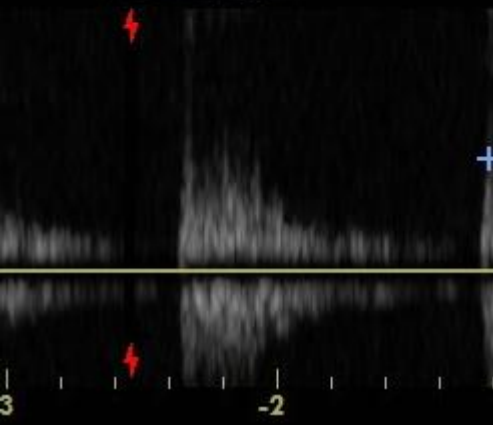
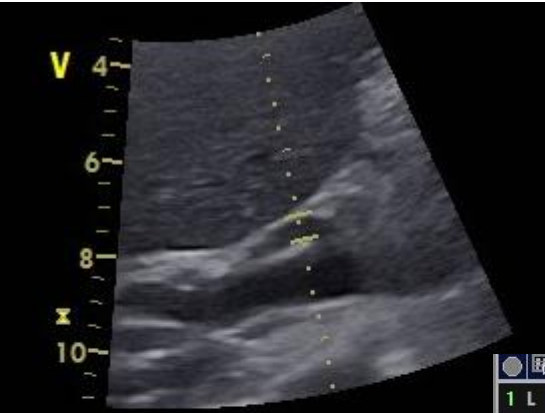
	Kolon	Dünndarm
Wanddicke*	2-4 mm	1-3 mm
Durchmesser*	< 5 cm	< 2,5 cm
Architektur	Haustren	Kerckring-Falten Jejunum: hohe Falten Ileum: niedrige Falten
Peristaltik		Lebhafte Peristaltik



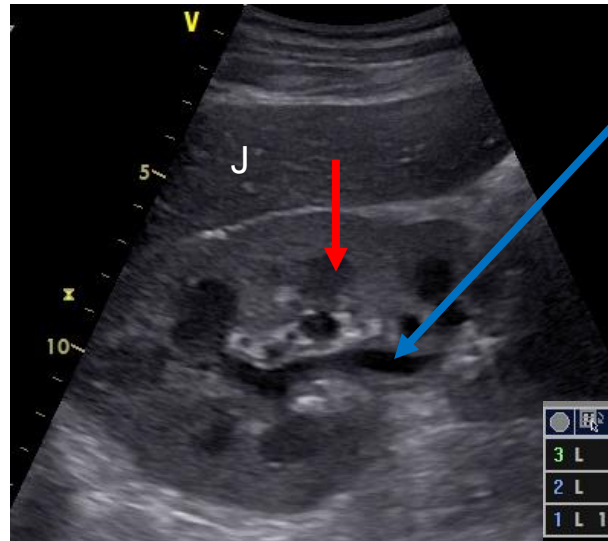
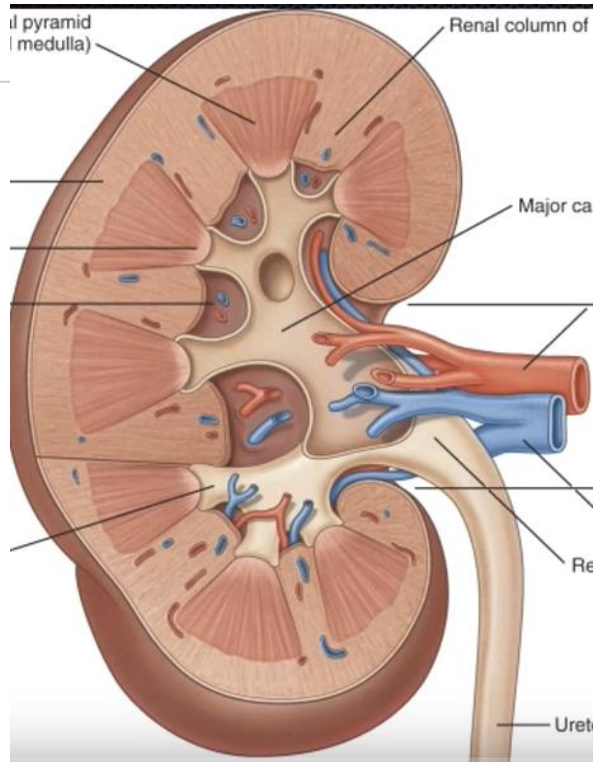
Cholestáza - biliárni dilatace



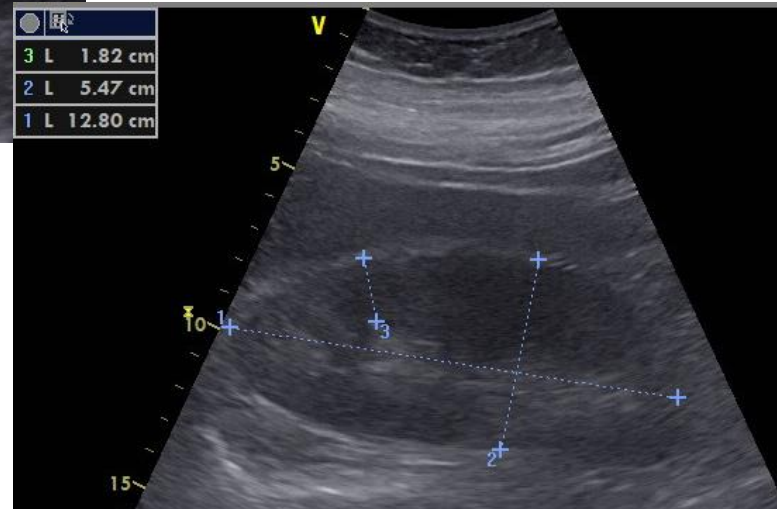
Cholestáza – biliárni dilatace



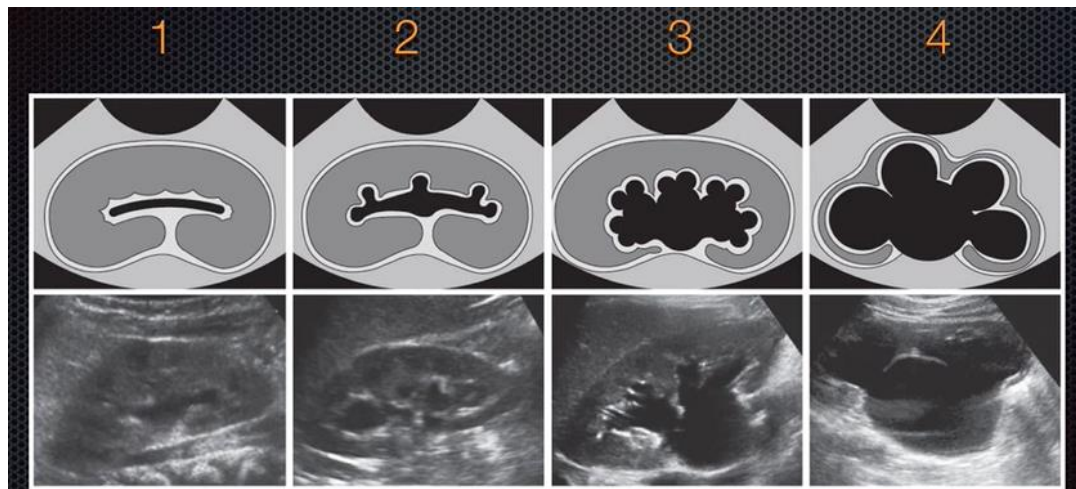
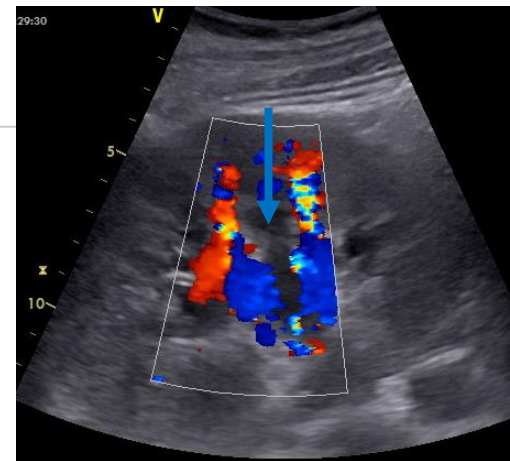
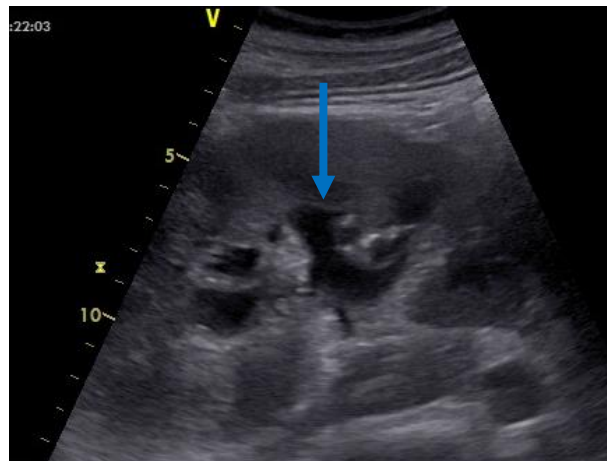
Akutní vs. chronická renální insuficienci



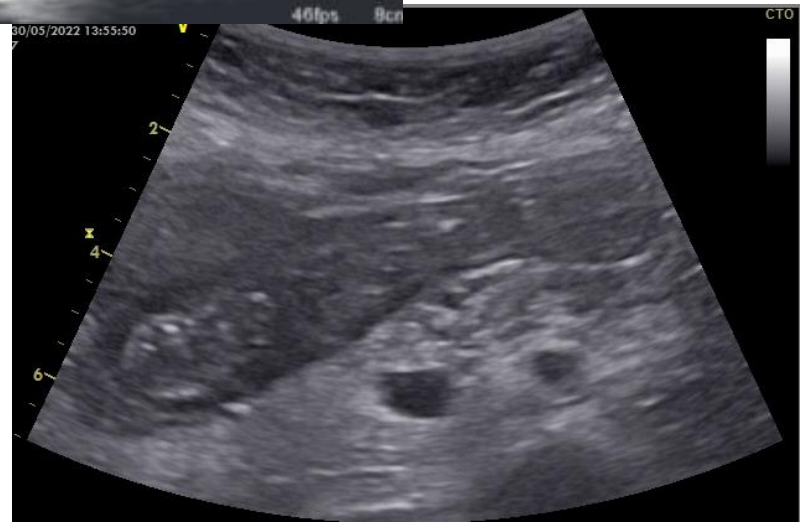
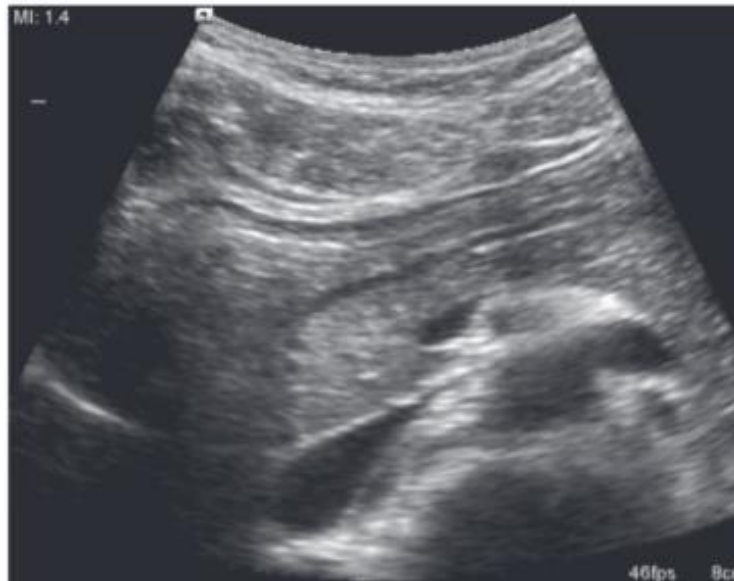
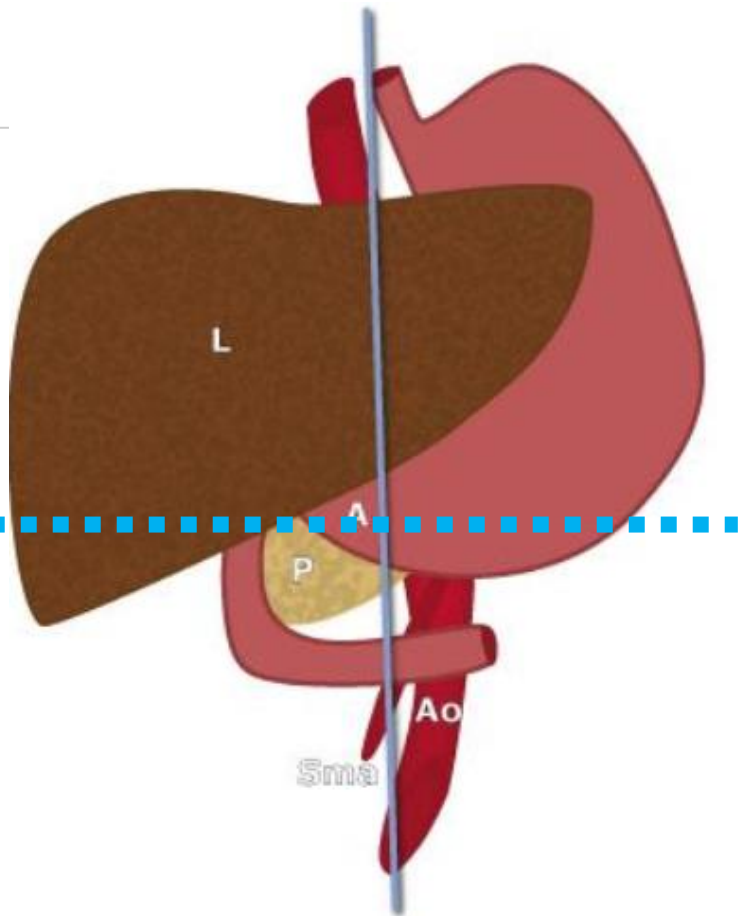
3 L	1.82 cm
2 L	5.47 cm
1 L	12.80 cm



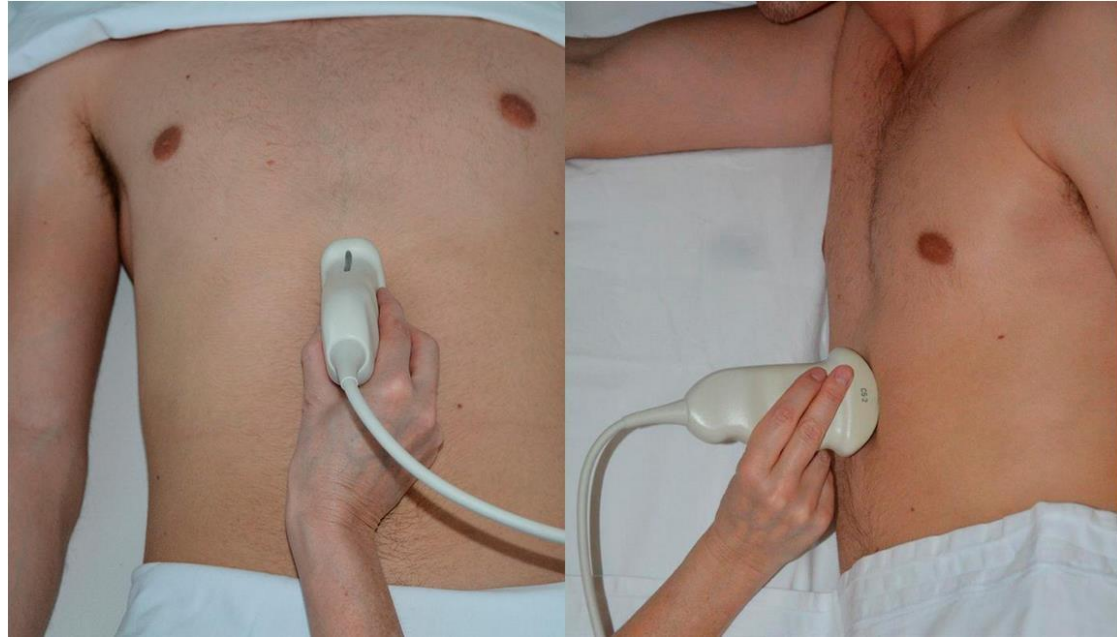
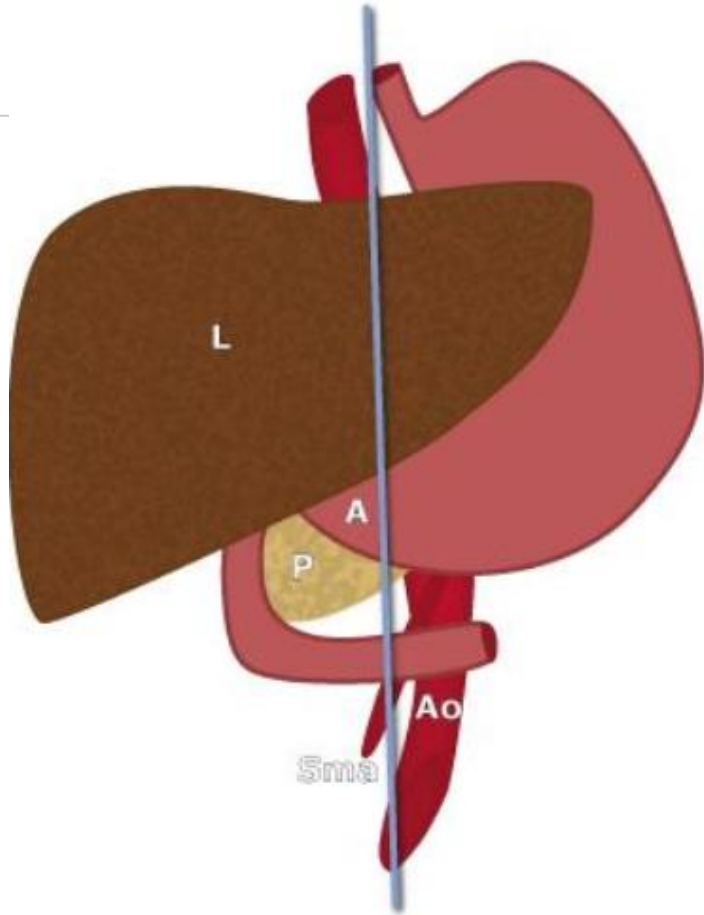
Subrenální blokáda – dilatace močových cest



Žaludek



Náplň žaludku

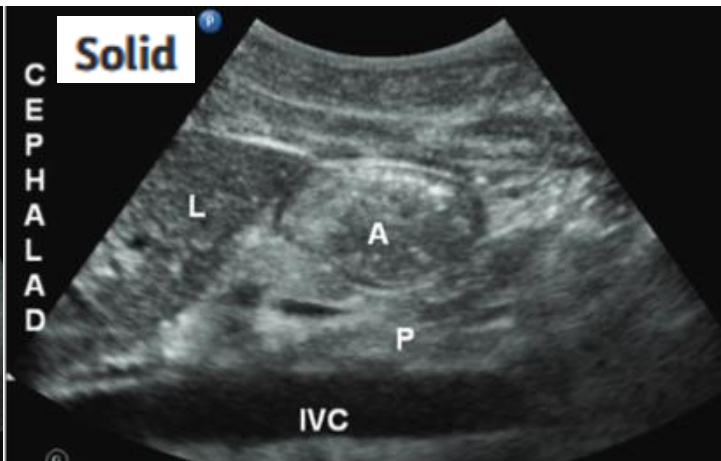
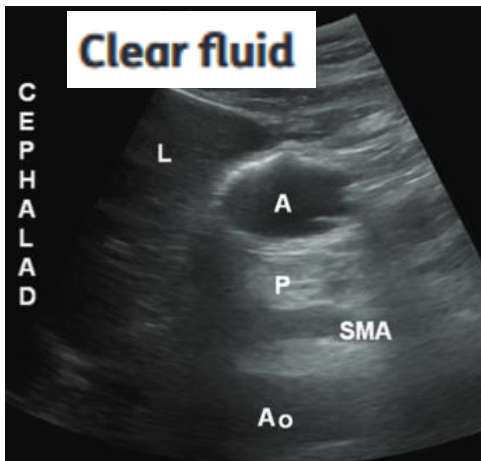
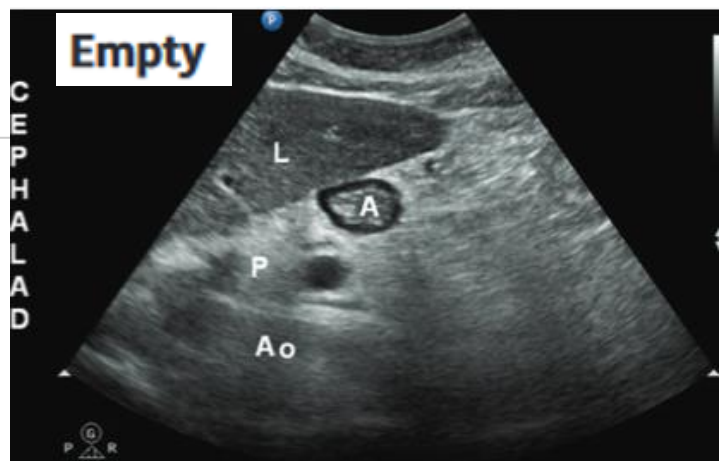


www.gastricultrasound.org

British Journal of Anaesthesia **113** (1): 12–22 (2014)

Advance Access publication 3 June 2014 · doi:10.1093/bja/aeu151

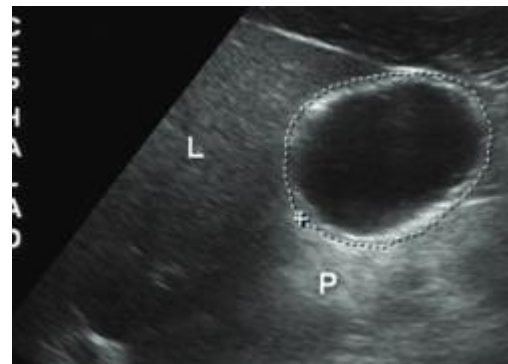
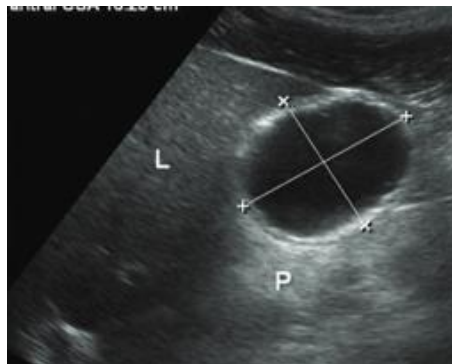
Náplň žaludku



$$\text{VOLUME (ML)} = 27.0 + 14.6 \times \text{RIGHT-LAT CSA} - 1.28 \times \text{AGE}$$

$$(r=0.86)$$

Perlas A, Mitsakakis N, Liu L, et al. Validation of a mathematical model for ultrasound assessment of gastric volume by gastroscopic examination. *Anesth Analg* 2013; **116**: 357–63



Náplň žaludku

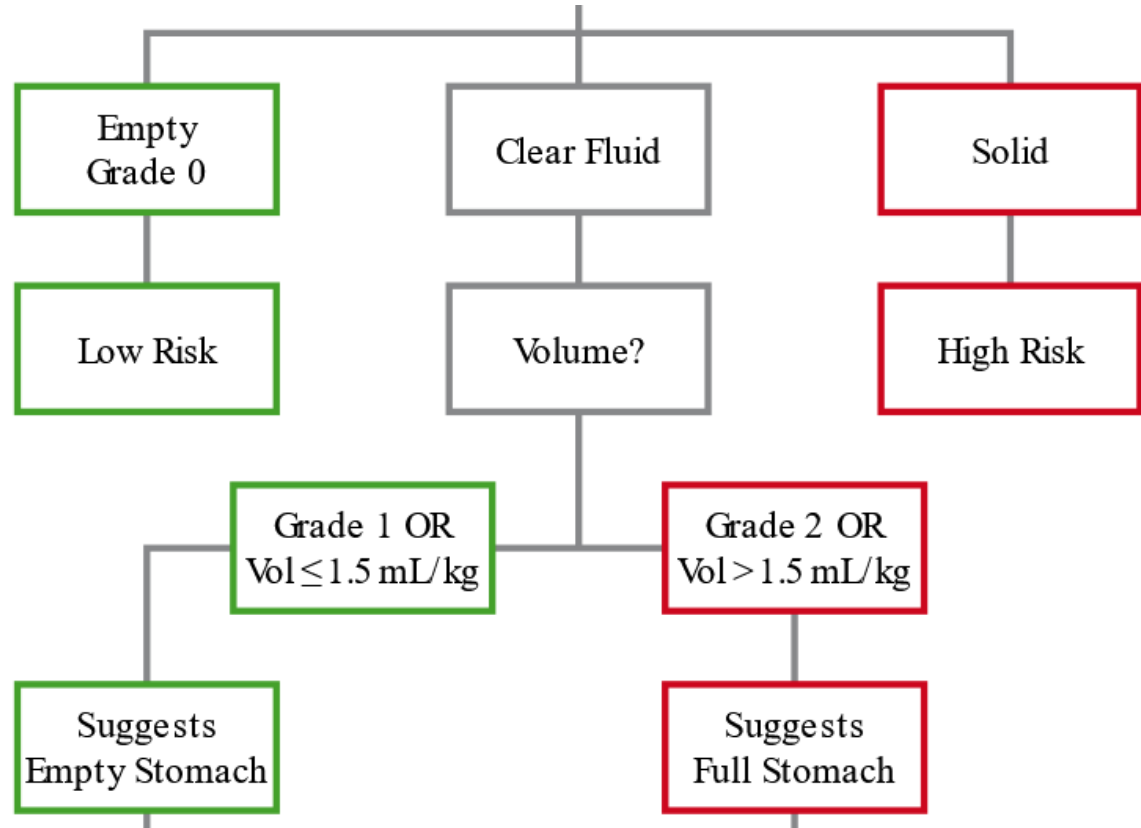
$$\text{VOLUME (ML)} = 27.0 + 14.6 \times \text{RIGHT-LAT CSA} - 1.28 \times \text{AGE}$$

☉ > 1.5 ml/kg

☉ > 9-10 cm²

Right lat CSA (cm ²)	Age(y)						
	20	30	40	50	60	70	80
2	31	18	5	0	0	0	0
3	45	32	20	7	0	0	0
4	60	47	34	21	9	0	0
5	74	62	49	36	23	10	0
6	89	76	63	51	38	25	12
7	103	91	78	65	52	40	27
8	118	105	93	80	67	54	41
9	133	120	107	94	82	69	56
10	147	135	122	109	96	83	71
11	162	149	136	123	111	98	85
12	177	164	151	138	125	113	100
13	191	178	165	153	140	127	114
14	206	193	180	167	155	142	129
15	220	207	194	182	169	156	143
16	235	222	209	200	184	171	158
17	249	236	224	211	198	185	173

Náplň žaludku - riziko aspirace



Náplň žaludku – elektivní intubace před anestezií



+



=

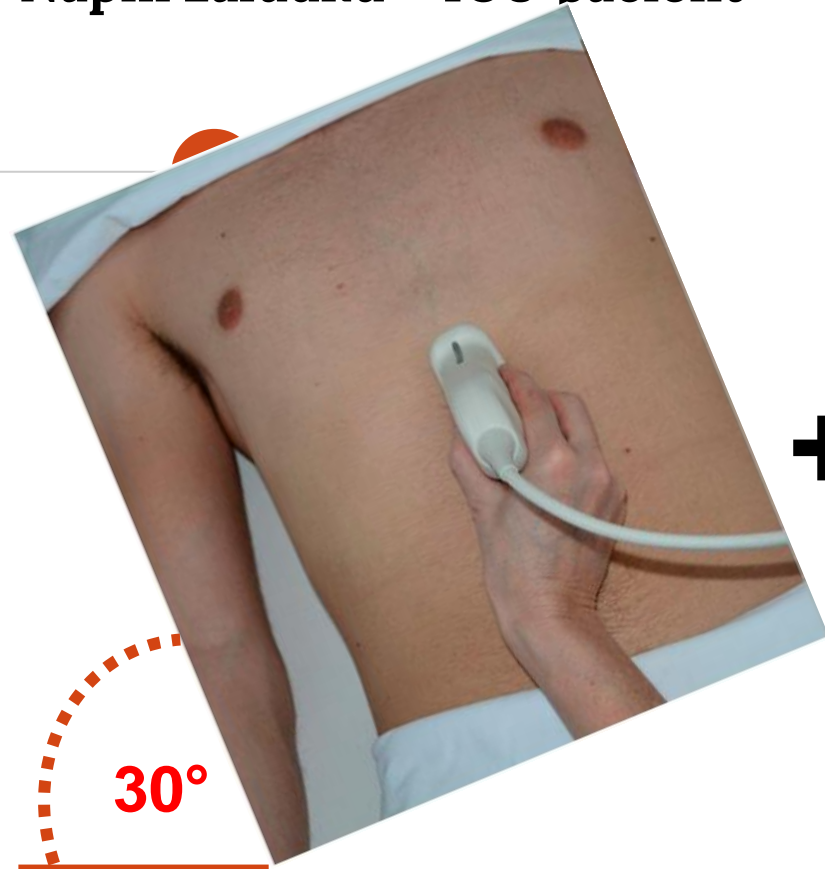


Náplň žaludku – ICU pacient

Ultrasound assessment of gastric volume in critically ill patients

Intensive Care Med (2014) 40:965–972

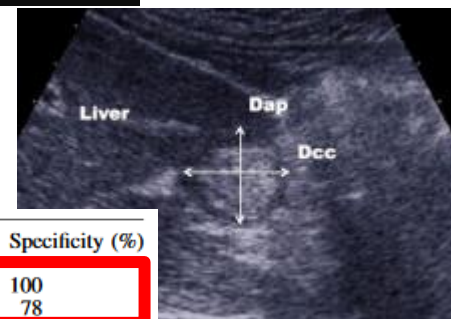
S. R. Hamada



+

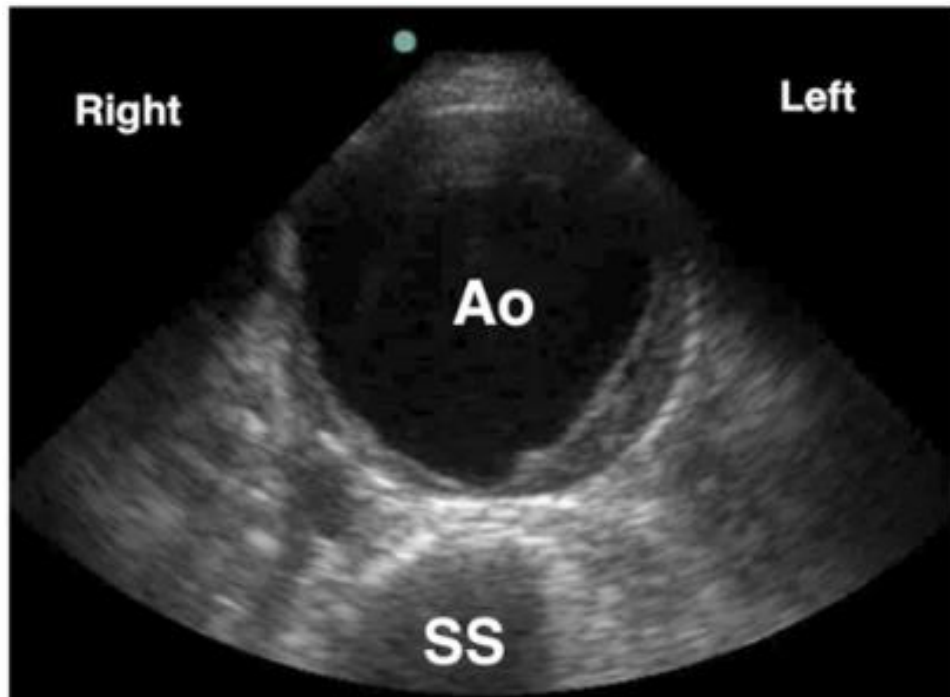


$(r = 0.43)$



Gastric volume (mL/kg)	usCSA (cm ²)	Sensitivity (%)	Specificity (%)
Total >0.4	2.45	86.6	100
Total >0.8	3.6	76	78

● Děkuji za pozornost!



Abdominální sonografie - Základní kurz,

lánován na **23.-25.zář 2022.**