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13 de Agosto 2020
Dr Ambiado

Incidence, risk factors and outcomes of acute kidney injury after surgical procedures

Yang Wu et al Pediatric Nephrology 2020 March

- Estudio retrospectivo 2017-2018 ,NICU China.
- RN con cirugías abdominales y torácicas
- Outcome: Incidencia de AKI

Incidence, risk factors and outcomes of acute kidney injury after surgical procedures

Yang Wu et al Pediatric Nephrology 2020 March

- Definición AKI KDIGO
- Kidney Disease : Improving Global Outcomes

Table 1 Neonatal KDIGO AKI definition

Stage	Serum creatinine (SCr)
No AKI	No change in SCr or rise <0.3 mg/dL
1	SCr rise ≥ 0.3 mg/dL within 48 h or SCr rise ≥ 1.5–1.9 X reference SCr*
2	SCr rise ≥ 2 to 2.9 X reference SCr*
3	SCr rise ≥ 3 X reference SCr* or SCr ≥ 2.5 mg/dL or receipt of dialysis

*Reference value is lowest previous value excluding days 0 and 1

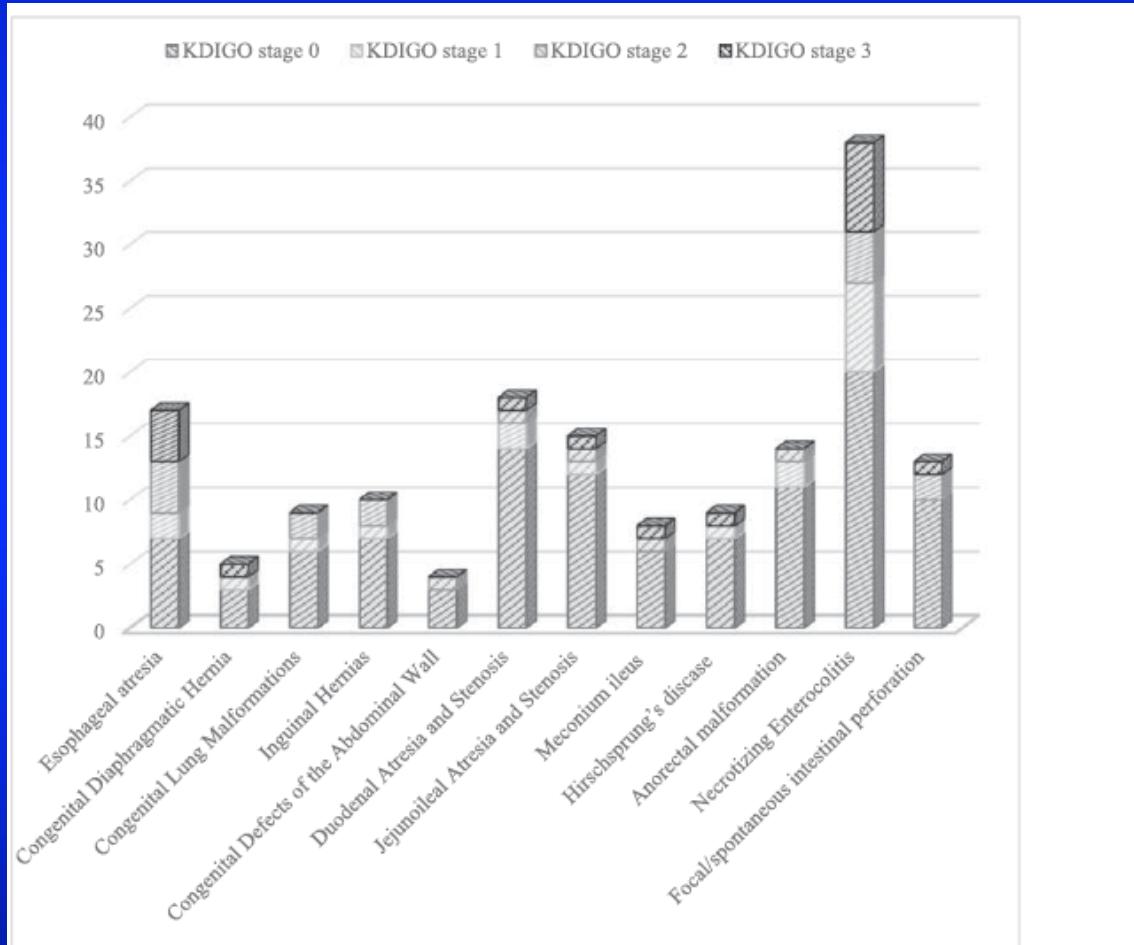
Incidence, risk factors and outcomes of acute kidney injury after surgical procedures

Yang Wu et al Pediatric Nephrology 2020 March

- n: 160
- Incidencia AKI: 54/160 33%
- AKI Stage 1 : 31/160 18%
- AKI Stage 2 : 13/160 8%
- AKI Stage 3 ; 10/160 6%

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Table 2 Multivariate analysis of risk factors of AKI in neonates after surgical procedures

Variables	Odds ratio (95% confidence interval)	β -Coefficient	p value
Very low birth weight (< 1500 g)	2.2 (0.84–5.9)	0.796	0.109
Gestational age < 32 weeks	4.8 (1.8–12.6)	1.575	0.001
Ventilation time > 2 days	1.3 (0.3–4.8)	0.256	0.702
Sepsis	4.3 (1.7–11.3)	1.463	0.003
Esophageal atresia	2.8 (0.8–9.5)	1.036	0.096
Necrotizing enterocolitis	3.5 (1.3–9.1)	1.246	0.011
Operation time > 120 min	2.7 (1.1–6.6)	1.006	0.024
Intraoperative blood loss > 10 mL/kg	1.8 (0.8–4.4)	0.602	0.175

Prevalence of Acute Kidney Injury(AKI) in Extremely Low Gestational Age Neonate

"Askenasi et al Penut Trial Consortium Pediatric Nephrology June 2020

- PENUT : Preterm Eritropoyetina Neuroprotection Trial
- Estudio Randomizado doble ciego , 19 NICU en USA, EG 24 0/7 – 27 6/7 sem, 2013 – 2016
- N°: 923

Prevalence of Acute Kidney Injury(AKI) in Extremely Low Gestational Age Neonate

"Askenasi et al Penut Trial Consortium Pediatric Nephrology June 2020

- Incidencia AKI: 351/923 38% IC 34,8 – 41,3%
- Incidencia AKI stage 2-3 168/923 18% IC 15,7 – 20.7%
- Incidencia AKI stage 2-3 según EG
 - 24 sem : 27,8%
 - 25 sem : 21,9%
 - 26 sem : 13,6%
 - 27 sem: : 9,4 %
- Incidencia AKI stage 1-2-3 según días : (3-7), (8-14), (> 14)

	3-7 días	8-14 días	> 14 días
Icidencia	112/923	142/891	249/875
%	12,1%	15,9%	28,5%
IC	10,0 – 14,3%	13,5 – 18,4%	25,4 – 31,5%

Prevalence of Acute Kidney Injury(AKI) in Extremely Low Gestational Age Neonate

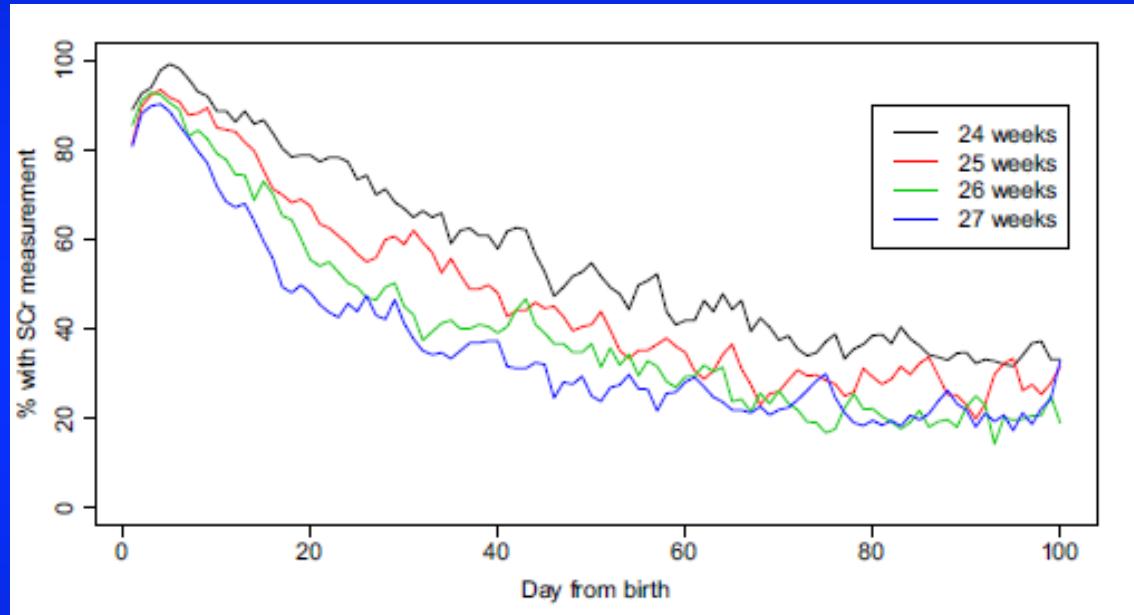
"Askenasi et al Penut Trial Consortium Pediatric Nephrology June 2020

	Gestational age at birth					<i>p</i> values
	All	24 weeks	25 weeks	26 weeks	27 weeks	
<i>n</i>	923	227	242	220	234	
AKI max anytime, <i>n</i> (%)						<0.01
No AKI	572 (62.0%)	96 (42.3%)	141 (58.3%)	158 (71.8%)	177 (75.6%)	
Stage 1	183 (19.8%)	68 (30.0%)	48 (19.8%)	32 (14.5%)	35 (15.0%)	
Stage 2	108 (11.7%)	48 (21.1%)	33 (13.6%)	13 (5.9%)	14 (6.0%)	
Stage 3	60 (6.5%)	15 (6.6%)	20 (8.3%)	17 (7.7%)	8 (3.4%)	
Severe AKI max anytime, <i>n</i> (%)						<0.01
No (stage 0 or 1)	755 (81.8%)	164 (72.2%)	189 (78.1%)	190 (86.4%)	212 (90.6%)	
Yes (stage 2 or 3)	168 (18.2%)	63 (27.8%)	53 (21.9%)	30 (13.6%)	22 (9.4%)	
AKI timing (max SCr)						
Early, <i>n</i> (%)						<0.01
No AKI	811 (87.9%)	179 (78.9%)	216 (89.3%)	201 (91.4%)	215 (91.9%)	
Stage 1	92 (10.0%)	43 (18.9%)	17 (7.0%)	15 (6.8%)	17 (7.3%)	
Stage 2	11 (1.2%)	4 (1.8%)	6 (2.5%)	0 (0.0%)	1 (0.4%)	
Stage 3	9 (1.0%)	1 (0.4%)	3 (1.2%)	4 (1.8%)	1 (0.4%)	
Middle, <i>n</i> (%)*						<0.01
No AKI	749 (84.1%)	152 (72.4%)	192 (82.1%)	196 (90.7%)	209 (90.5%)	
Stage 1	90 (10.1%)	40 (19.0%)	26 (11.1%)	11 (5.1%)	13 (5.6%)	
Stage 2	41 (4.6%)	18 (8.6%)	13 (5.6%)	4 (1.9%)	6 (2.6%)	
Stage 3	11 (1.2%)	0 (0.0%)	3 (1.3%)	5 (2.3%)	3 (1.3%)	
Late, <i>n</i> (%)**						<0.01
No AKI	626 (71.5%)	108 (52.2%)	155 (68.6%)	168 (79.2%)	195 (84.8%)	
Stage 1	117 (13.4%)	45 (21.7%)	33 (14.6%)	20 (9.4%)	19 (8.3%)	
Stage 2	84 (9.6%)	40 (19.3%)	21 (9.3%)	12 (5.7%)	11 (4.8%)	
Stage 3	48 (5.5%)	14 (6.8%)	17 (7.5%)	12 (5.7%)	5 (2.2%)	

Early (days 3–7); middle (days 8–14); late (days 15—discharge or 44 weeks whichever occurred first)

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Prevalence of Acute Kidney Injury(AKI) in Extremely Low Gestational Age Neonate

"Askenasi et al Penut Trial ConsortiumPediatric Nephrology June 2020

Table 9 Core laboratory SCr and cystatin C values by gestational age

n	Gestational age at birth					<i>p</i> values
	All	24 weeks	25 weeks	26 weeks	27 weeks	
	624	158	172	145	149	
Mean (sd) [n]						<i>p</i> values
SCr						
Day 0	0.85 (0.20) [551]	0.83 (0.25) [140]	0.85 (0.20) [153]	0.86 (0.16) [128]	0.85 (0.15) [130]	0.33
Day 7	0.79 (0.23) [514]	0.83 (0.24) [119]	0.82 (0.26) [145]	0.77 (0.23) [121]	0.73 (0.17) [129]	<0.01
Day 9	0.74 (0.23) [506]	0.77 (0.21) [123]	0.79 (0.28) [135]	0.72 (0.23) [120]	0.67 (0.16) [128]	<0.01
Day 14	0.68 (0.23) [457]	0.75 (0.25) [108]	0.74 (0.27) [122]	0.64 (0.20) [107]	0.60 (0.16) [120]	<0.01
Max	0.92 (0.25) [621]	0.95 (0.28) [158]	0.94 (0.29) [172]	0.90 (0.22) [144]	0.86 (0.18) [147]	<0.01
Change days 0 to 7	-0.06 (0.28) [473]	-0.01 (0.35) [110]	-0.06 (0.27) [133]	-0.06 (0.27) [112]	-0.12 (0.19) [118]	<0.01
Change days 0 to 9	-0.11 (0.27) [450]	-0.05 (0.27) [106]	-0.08 (0.32) [120]	-0.12 (0.26) [107]	-0.18 (0.19) [117]	<0.01
Change days 0 to 14	-0.17 (0.28) [430]	-0.08 (0.37) [101]	-0.15 (0.27) [113]	-0.20 (0.22) [102]	-0.25 (0.20) [114]	<0.01
Change days 7 to 9	-0.05 (0.15) [441]	-0.05 (0.18) [100]	-0.04 (0.16) [121]	-0.05 (0.14) [107]	-0.06 (0.10) [113]	0.57
Change days 7 to 14	-0.10 (0.21) [413]	-0.07 (0.26) [94]	-0.08 (0.21) [114]	-0.13 (0.18) [97]	-0.12 (0.16) [108]	0.03
Cystatin C						
Day 0	1.27 (0.23) [537]	1.24 (0.25) [140]	1.29 (0.23) [144]	1.26 (0.20) [124]	1.30 (0.23) [129]	0.13
Day 7	1.38 (0.43) [505]	1.31 (0.29) [116]	1.43 (0.67) [144]	1.40 (0.27) [118]	1.39 (0.27) [127]	0.19
Day 9	1.41 (0.56) [502]	1.40 (0.72) [123]	1.46 (0.74) [133]	1.39 (0.30) [120]	1.40 (0.27) [126]	0.73
Day 14	1.42 (0.29) [454]	1.44 (0.35) [109]	1.45 (0.35) [121]	1.40 (0.22) [104]	1.38 (0.23) [120]	0.06
Max	1.54 (0.51) [621]	1.55 (0.65) [157]	1.58 (0.67) [171]	1.50 (0.28) [144]	1.51 (0.26) [149]	0.27
Change days 0 to 7	0.10 (0.44) [452]	0.05 (0.26) [109]	0.12 (0.73) [124]	0.13 (0.28) [105]	0.10 (0.23) [114]	0.22
Change days 0 to 9	0.13 (0.59) [433]	0.16 (0.75) [107]	0.15 (0.82) [112]	0.11 (0.28) [102]	0.11 (0.27) [112]	0.42
Change days 0 to 14	0.13 (0.31) [414]	0.20 (0.37) [102]	0.15 (0.32) [108]	0.12 (0.25) [94]	0.07 (0.27) [110]	<0.01
Change days 7 to 9	0.02 (0.24) [431]	0.03 (0.26) [99]	0.03 (0.27) [118]	0.01 (0.24) [104]	0.02 (0.21) [110]	0.57
Change days 7 to 14	0.03 (0.49) [402]	0.13 (0.35) [92]	0.00 (0.79) [112]	-0.03 (0.27) [91]	0.00 (0.25) [107]	0.02

Acute Kidney Injury Guidelines Are Associated With Recognition And Follow-up For Neonatal Patients

Vincet K et al. Advance inNeonatal Care 2020 (4)

- Estudio restrospectivo evaluando la implementación de una guía para reconocer y manejar AKI
- Objetivos : maximizar identificación de Aki y la derivación a seguimiento con nefrólogo
- 2 cohortes , antes y después de guía

Guías manejo AKI

Meta

- Maximizar identificación de neonates con AKI
- Maximizar acercamiento a manejo multidisciplinario en RN con AKI
- Estandarizar seguimiento RN con diagnóstico de AKI

Factores de riesgo

Definición

- Incremento creatininemia ≥ 0.3 mg/dl en período de 48 h ó
- Incremento creatininemia ≥ 1.5 veces el valor basal de últimos 7 días
- Diuresis < 0.5 ml/kg/h por 6 h en RN > 24 h o RNMBP > 72 h
- Creatininemia que no baja a < 1 mg/dl a las 2 semanas de vida o aumenta

Evaluación

- Incluye identificar factores de riesgo, revisar medicamentos, monitorizar creatininemia, eco Doppler

MANEJO

SEGUIMIENTO POSTALTA: Todo RN con AKI control a los 3 meses con nefrólogo

Acute Kidney Injury Guidelines Are Associated With Recognition And Follow-up For Neonatal Patients

Vincet K et al. Advance inNeonatal Care 2020 (4)

TABLE 2. Outcomes for Patients With Acute Kidney Injury

Outcomes Among Patients With AKI	AKI Stage	Episodes of AKI Within Cohort 1 (n = 68 Episodes)	Episodes of AKI Within Cohort 2 (n = 15 Episodes)	P
AKI stage (n) ^a	Stage 1	45 (66%)	8 (53%)	.35
	Stage 2	15 (22%)	6 (40%)	.19
	Stage 3	8 (12%)	1 (7%)	1.00
AKI episodes documented in EMR	Overall	24/68 (35%)	12/15 (80%)	.003
	Stage 1	17/45 (38%)	6/8 (75%)	.07
	Stage 2	3/15 (20%)	5/6 (83%)	.01
	Stage 3	4/8 (50%)	1/1 (100%)	1.00
Inpatient pediatric nephrology consultation	Overall	12/68 (18%)	12/15 (80%)	<.001
	Stage 1	7/45 (16%)	6/8 (75%)	.002
	Stage 2	2/15 (13%)	5/6 (83%)	.006
	Stage 3	3/8 (38%)	1/1 (100%)	.44

Abbreviations: AKI, acute kidney injury; EMR, electronic medical record.

^aAKI staged via modified Kidney Disease: Improving Global Outcome Criteria (KDIGO) staging using serum creatinine criteria only.

Neonatal Acute Kidney Injury AAP

Pediatrics Agosto 2015

- 2003 Se crea National Kidney Fundation. KDIGO es encargada de generar y difundir guías , inicialmente es parte de National Kidney Fundation
- 2005.Aparecen primeras definiciones de AKI en adultos y pediatría
- 2013. KDIGO aparece como fundación independiente (Kidney Diseases Improving Global Outcome define 3 categorías en AKI
- 2013 NIDDK workshop define clasificación KDIGO modificada
- 2014 .Se creó el año 2014 el Neonatal Kidney Collaborative

TABLE 1 Neonatal AKI KDIGO Classification

Stage	SCr	Urine Output
0	No change in SCr or rise <0.3 mg/dL	≥ 0.5 mL/kg/h
1	SCr rise ≥ 0.3 mg/dL within 48 h or SCr rise ≥1.5–1.9 × reference SCr ^a within 7 d	<0.5 mL/kg/h for 6 to 12 h
2	SCr rise ≥2.0–2.9 × reference SCr ^a	<0.5 mL/kg/h for ≥ 12 h
3	SCr rise ≥3 × reference SCr ^a or SCr ≥2.5 mg/dL ^b or Receipt of dialysis	<0.3 mL/kg/h for ≥24 h or anuria for ≥12 h

Neonatal Acute Kidney Injury AAP

Pediatrics Agosto 2015

TABLE 3 Common Nephrotoxic Medications in NICU

Drug	Mechanism
Acyclovir	Urinary precipitation, especially with low flow and hypovolemia, with renal tubular obstruction and damage and decreased GFR. May cause direct tubular toxicity (metabolites).
Angiotensin-converting enzyme inhibitors	Decreased angiotensin II production inhibiting compensatory constriction of the efferent arteriole to maintain GFR.
Aminoglycosides	Toxic to the proximal tubules (transport in the tubule, accumulate in lysosome, intracellular rise in reactive oxygen species and phospholipidosis, cell death); intrarenal vasoconstriction and local glomerular/mesangial cell contraction.
Amphotericin B	Distal tubular toxicity, vasoconstriction, and decreased GFR.
Nonsteroidal antiinflammatory drugs	Decreased afferent arteriole dilatation as a result of inhibiting prostaglandin production resulting in reduced GFR.
Radiocontrast agents	Renal tubular toxicity secondary to increase in reactive oxygen species; intrarenal vasoconstriction may play a role.
Vancomycin	Mechanism of AKI unclear; possible mechanism includes proximal tubular injury with generation of reactive oxygen species.

Incidence and Importance of Portal Venous Gas in Children With Hypertrophic Pyloric

Kelly M et al. Pediatric Radiology Junio 2020

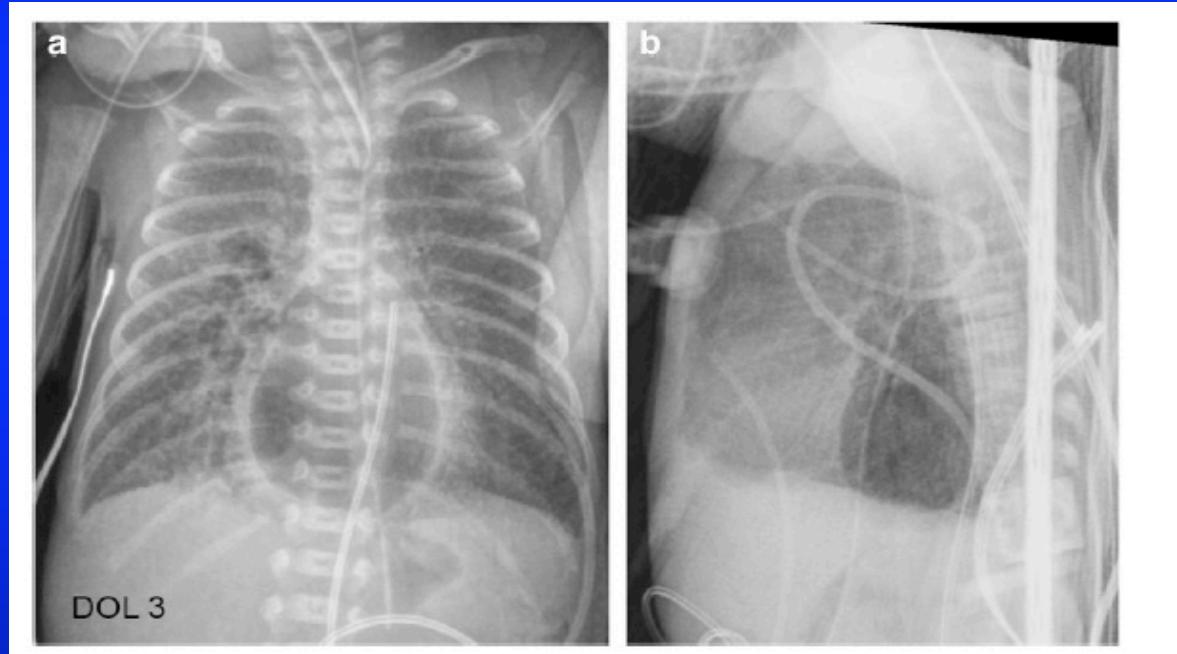
- Estudio retrospectivo USA, 2010-2017 n : 334
- Objetivo: Evaluar incidencia de gas portal en pacientes con estenosis hipertrófica del píloro
- Resultado: 1,8% presentó gas portal

	Portal venous gas	No portal venous gas	P-value ^a
Male: total patient ratio (% male)	4:6 (66.7%)	268:328 (81.7%)	0.31
Age at presentation (range) in days	41.3 (24.5–50.1)	39.5 (11.6–220.1)	0.34
Length of symptoms (range) in days	15.8 (4.0–50.0)	10.0 (1.0–109.0)	0.56
Electrolyte abnormality ^b	83.3%	74.3%	1.00
Length of hospital stay (range) in days	1.8 (1.0–2.0)	2.4 (0–25.0)	0.62
HPS with sufficient imaged liver	6 (1.8%)	328 (98.2%)	
Pyloric wall thickness (range) in mm	4.2 (3.0–5.0)	4.4 (2.0–7.0)	0.75
Pyloric length (range) in mm	20.6 (17.0–24.0)	19.1 (13.0–28.1)	0.19

Minimally invasive treatment of retrocardiac tension pneumomediastinum in an extremely low birth weight infant

Michael J. Ponkowski¹ • Bhupender Yadav² • Elisabeth Meagher² • Anthony Ho²  • Ranjith Vellody²

Pediatric Radiology 2020 USA : 23 sem , 540 g,
día 3



Día 8

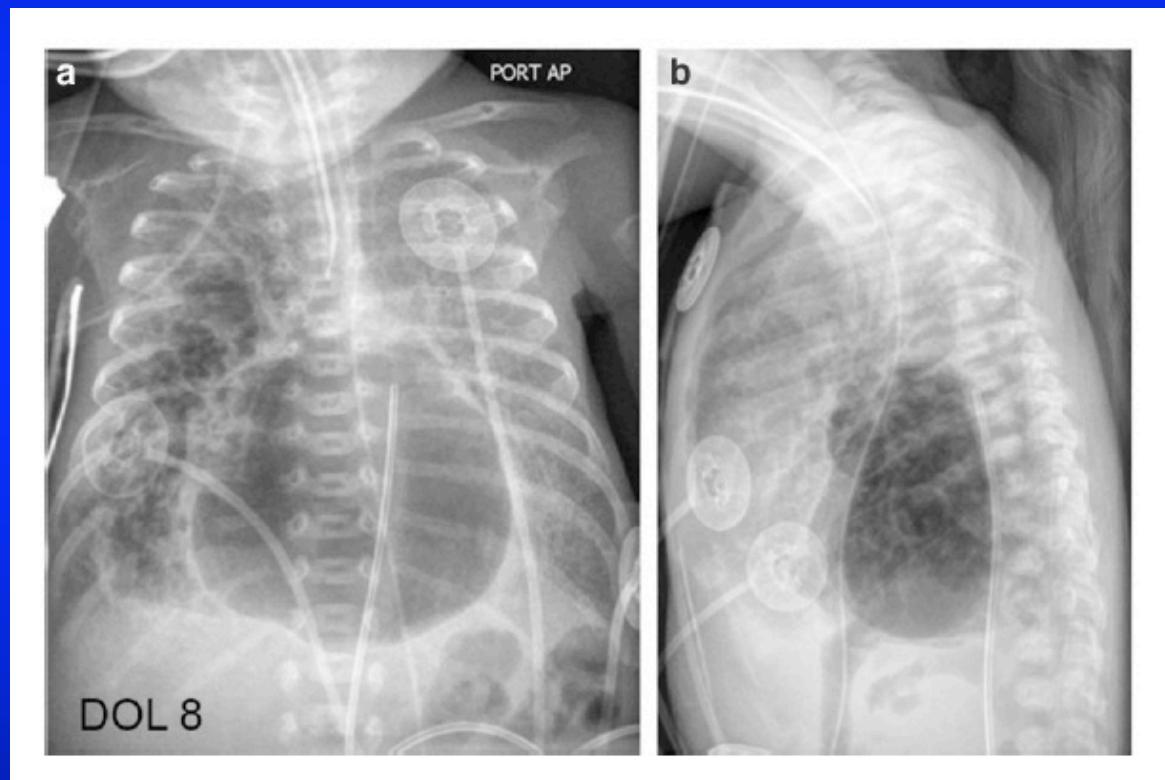
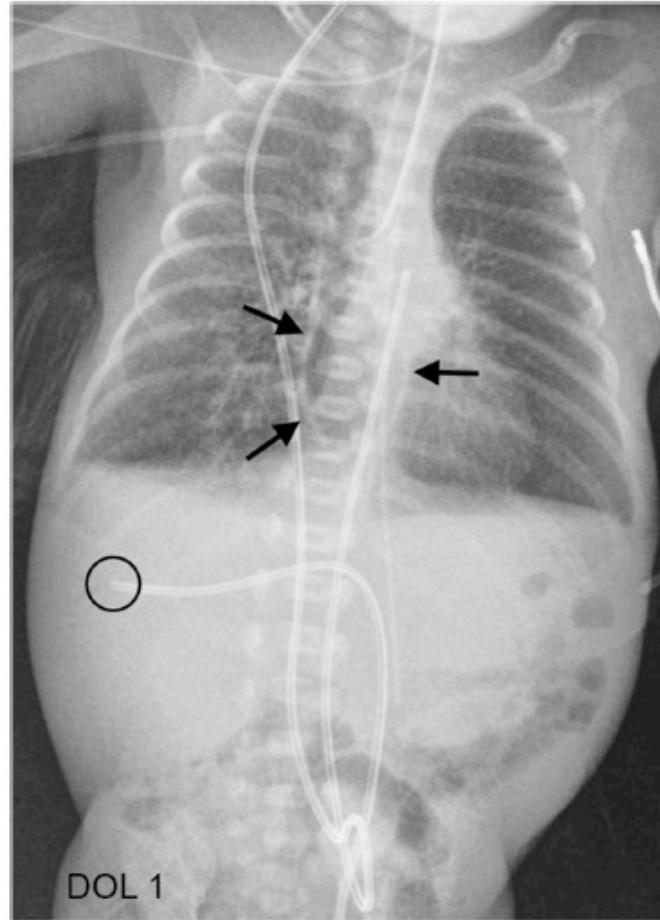




Fig. 5 Anteroposterior supine portable chest radiograph immediately after pigtail tube placement from a right posterior paraspinal approach demonstrate the pigtail tube adequately positioned with resolution of retrocardiac pneumomediastinum. There is no pneumothorax. Retained contrast in the colon is from a bedside esophagram performed the day before.



On Minute Ultrafast Brain MRI With Full Basic Sequences : Can It Be a Promising Way Forward for Pediatric Neuroimaging

American Radiology Journal of Roentgenology , Julio 2020

- 23 pacientes pediátricos
- Tiempo estándar: 9 min
- Protocolo en estudio: 1 min