Medical Mystery Cases

A Rocky Start

PODCAST 32

Narrator: Rocky Mountain National Park, near Estes Park, Colorado, was established in 1915. It is expansive encompassing 265,461 acres. Soaring peaks, wild rivers, clear alpine lakes, and an amazing array of flora and fauna attract over 4 million visitors each year. It is in this extraordinary beauty where Paul and Sofia Ramirez worked as park rangers, fell in love, and this past year, began their plans to embark on a new adventure—a baby.

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Sofia, now in her 3rd trimester, began having contractions and noticed a clear fluid leaking and was worried. She called her obstetrician's office and they advised her to have Paul drive her to the emergency department.

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ED nurse: Sofia, how far along are you?

Sofia: 32 weeks… But it's too soon for the baby. I don't know if this is just Braxton Hicks or real contractions… she is my first.

ED nurse: I'm going to put you on a monitor and check your cervix. We'll figure this out. Dr. Sims will be here soon to see you.

Narrator: Tests confirmed rupture of membranes. Sofia was admitted, given antibiotics and betamethasone injections to mature the baby's lungs. After 48 hours, she developed a low-grade fever and mild abdominal tenderness. A decision was made to deliver the baby by cesarean section for suspected chorioamnionitis.

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Sofia: What's happening?

Dr. Sims: Between the fever and your stomach being tender, I think you have a uterine infection. We are going to take you to labor and delivery.

Paul: But it's too soon isn't it? Will our baby be okay?

Dr. Sims: She's over 32 weeks now. The baby will have to be put into the neonatal intensive care unit but it is what we have to do for your wife and daughter. We will take excellent care of them.

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Narrator: At first, it seemed everything would be okay. The baby let out a strong cry, and after 60 seconds of delayed cord clamping, she was taken to the warmer. She weighed 3 pounds, 10 ounces. The nurses dried her off and examined her. A nurse obtained umbilical cord blood gases with a handheld analyzer and the results were reassuring. They let Sofia and Paul hold her for a few seconds and then she was returned to the warmer.

Paul was attending his daughter's warmer when the respiratory therapist asked him to move aside. At five minutes of age, the baby started to have some difficulty breathing. After a few tense moments, the respiratory therapist had an oxygen tube over the baby's nose and informed the neonatologist, Dr. Patel, that they had started a CPAP.

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Dr. Patel: OK, continue CPAP +5 at 30% O2, please.

Paul: What's wrong with her? What are you doing?

Labor & Delivery nurse: We are just helping her breathe a little bit. Did you see how her nostrils were flaring and she was making that grunting noise and it seemed like she was trying to breathe really fast? She's doing better with the oxygen now so we are going to take her over to say hi to mom and then we will take her to the NICU so we can monitor her more closely.

Dr. Patel: Hi Sophia. I'm the tiny baby doctor. My team…we will be taking very good care of your baby.

Sophia: Ohhhh… thank you…

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Narrator: The newborn is taken to the NICU where she is evaluated and continuously monitored by the respiratory therapist and nurses.

Dr. Patel: Let me see the bedside lab results. Ahh…looks like RDS. We have some respiratory acidosis, the pH is 7.29, pCO2 is high at 66 and pO2 is low at 41. Her glucose a bit low so go ahead and get a peripheral IV with dextrose. HCT is 61%, that's due to the delayed cord clamping. It looks like everything else is in normal range. Keep up with the CPAP as is, let's get an orogastric tube and chest x-ray. Go ahead and get a CBC and blood cultures too. Start antibiotics since mom had a uterine infection.

Let's keep her NPO but start TPN. Do a loading dose of IV caffeine citrate and continue to monitor. Call me if there are any changes…

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Narrator: The following morning in the NICU…

Dr. Patel: How is niña de pecho doing?

NICU nurse Eve: At 0700, her capillary blood gas and glucose were completely normal. No growth on the blood cultures and the respiratory therapist has the CPAP at +5 to keep her above 90%.

Dr. Patel: She looks better today, responsive, good muscle tone and reflexes…and plenty loud! She has a small murmur but that's normal at this age. Her breathing is much improved now.

Bowel sounds are good and she's passing stool. Let's keep the CPAP +5 titrated to keep sats above 90% and keep the antibiotics for a full 48 hours. Continue the caffeine citrate at maintenance, start full TPN and start trophic feedings of maternal breastmilk via the orogastric tube.

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Narrator: At 72 hours of age, the baby tolerated increasing feedings well, was voiding and passing transitional stools, and morning capillary labs all within reference range. Peripheral IV was lost and was difficult to restart so decision was made to advance feedings more rapidly to reach feeding goal and change caffeine to oral. Baby remained stable for next 24 hours.

On the eve of day 4, the baby suffered a cluster of apnea spells requiring vigorous stimulation to resolve. Eve and the respiratory therapist examined her and noted increased respiratory rate with retractions, grunting, lethargy, and pallor. Baby's heart rate was mildly elevated with a continued quiet, murmur. Her abdomen appeared mildly distended but soft and slightly tender to palpation. Bowel sounds present but hypoactive. Eve called Dr. Patel to alert her.

NICU nurse Eve: No stools over the past 12 hours. She was latching earlier and having normal feedings--but now she isn't attempting...she just vomited, and it was green.

Dr. Patel: OK, we should investigate this. I want you to run another bedside blood gas and BMP, also sent a CBC, CRP, culture to lab... were you ever able to get another IV started?

NICU nurse Eve: No.

Dr. Patel: Ok, try again and get those labs as a capillary stick plus a chest-abdomen x-ray and let's see what we are dealing with here...could be the RDS, infection, something cardiac with the murmur, or even metabolic.

NICU nurse Eve: Blood gases pH 7.27 CO2 36, PO2 44, HCO3 18, Base Deficit -6, Na 130, K 5.8, BUN 22, Cr 1.7, HCT 37%, all other labs are normal but her **lactate** is 3.1. The radiology report on the chest x-ray says granular appearance, low lung volumes, mild pulmonary edema. Abdomen - mildly dilated bowel loops present, no free air or pneumatosis visible.

Dr. Patel: Start sepsis protocol, stop feedings and go back to CPAP +5. Since we can't get an IV, the nurse practitioner will place a PICC. Watch her closely.

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Narrator: 2 hours later, Dr. Patel returns to the NICU.

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NICU nurse Eve: Dr. Patel!! Elevated heart rate, low BP, RT says her O2 needs are back up to over 50%. We are having a hard time placing the PICC.

Dr. Patel: Breathing is very labored now and her belly is firm, tender with large bowel loops. She's pale, mottled and lethargic.

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Narrator: As the NICU team urgently assembles by the Ramirez baby, she has another severe apnea event, is emergently intubated and placed on a ventilator by the respiratory therapist.

Healthcare professionals, what is happening? What information do you need? What tests would you order?

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Narrator: Repeat labs and portable x-rays were ordered. NICU team has extreme difficulty obtaining arterial labs due to baby's low blood pressure and SHOCK so STAT capillary sample is drawn.

Labs are available in seconds on the handheld device.

pH 7.09 CO2 51, PO2 24, HCO3 15, Base Deficit -13 demonstrating mixed respiratory and metabolic acidosis. Na 122 (low), K 6.1 (high), BUN 30 (high), Cr 3.2 (high), iCa 0.98 (low), GLUC 33 (low), HCT 29% (low), **lactate** 8.6 (high)

Narrator: ***Healthcare professionals, what do these lab results tell us?***

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Narrator: Chest x-ray revealed endotracheal tube in the mid-trachea, increased lung volumes compared to previous, pulmonary edema still present with granular opacities throughout, no evidence of pneumothorax.

Abdomen x-rays revealed dilated and fixed bowel loops with pneumatosis present in the small bowel. Tiny sliver of free air present over the liver confirmed diagnosis of necrotizing enterocolitis with small perforation of the bowel.

Early necrotizing enterocolitis or NEC is the most common and life-threatening intestinal infection among premature babies. Early NEC on a workup can initially have subtle findings.

Narrator: ***Healthcare professionals, what are the next steps?***

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Narrator: The baby was treated aggressively with antibiotics and ventilator support. PICC and arterial lines were placed and point of care lab testing was followed closely. She was treated for shock with blood transfusions and medications. Pain medications were administered for comfort. A surgical consult was obtained, and the baby required only a temporary abdominal drain.

After several weeks of antibiotics, bowel rest, and gradual return to normal feedings, the baby was discharged from the NICU on her due date!

Dr. Patel: Happy due-date! It's been rocky but finally, Kemena can go home today.

Sophia: Thank you so much.

Paul: Mil gracias.

Dr. Patel: Your daughter's name is beautiful. What does it mean?

Paul: Kemena, in Spanish, means "having great strength."

Continued

Narrator: Thank you for listening to our Medical Mystery podcast. If you enjoyed this audio journey, please subscribe and share with your friends and colleagues.

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